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# Demographic Trends in Prescription Pain Reliever Misuse and Treatment-Seeking for Addiction

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Abstract

Opioid addiction in the United Sates has reached epidemic proportions in recent years, demanding targeted efforts in both clinical medicine and public health. This analysis outlined a demographic profile of recent prescription pain reliever (PPR) misusers and compared those characteristics to the population of individuals currently enrolled in addiction treatment. To explain the difference in numbers between these two populations, reported reasons for non-treatment seeking are analyzed by demographic characteristic. This discussion reviews existing literature profiling PPR misusers and treatment-seekers, as well as research exploring barriers to addiction treatment. A secondary analysis was performed using data from the National Survey on Drug Use and Health (NSDUH), collected in 2015. Recent PPR misuse (within the past 30 days) and current treatment enrollment status was compared to a number of demographic characteristics, exploring discrepancies between categories. Reported barriers to treatment were evaluated by demographic characteristic. Analysis uncovered a number of high-risk demographic groups that are proportionately represented in addiction treatment facilities: homosexuals, divorcees, young adult males aged 18-34, and those with only a high school diploma or GED. It is hoped that this study informs a targeted clinical and public health approach to addressing opioid addiction.

*Keywords*: addiction, opioid abuse, prescription pain relievers, demographic trends

Demographic Trends in Prescription Pain Reliever Misuse and Treatment-Seeking for Addiction

The United States has been deeply entrenched in opioid dependence and subsequent opioid-related deaths for the past several years, overwhelming the capacity of addiction medicine specialists. The epidemic proportion of this crisis has encouraged primary health care facilities to enhance their capabilities for treating addiction in order to accommodate the growing numbers of opioid-dependent patients. However, a relatively small portion of opioid-dependent patients are willing and/or able to access such treatment (Compton, Thomas, Stinson, & Grant, 2007).

**History of Pain Management and Opiate Prescribing**

For centuries, medicine has attempted to reach a consensus on the management of pain, and opioid medications have been a central player in the ongoing debate. Throughout the 19th century, opiates were prescribed indiscriminately for the management of acute or recurring pain, without today's knowledge of the addictive properties of such medications (Meldrum, 2003). Opium and morphine were commonplace for the treatment of a variety of ailments and were even used to soothe colicky children (Brownstein, 1993).

By 1910, opioid medications had begun to be abused, elevating the street value of such drugs (Meldrum, 2003). Oxycodone, for example, sells for $80 per 80-mg tablet today, while hydromorphone may earn 3.3 times as much on the street (Dasgupta et al., 2013). This illustrates the expensive nature of prescription opioid medications outside the clinical setting (Dasgupta et al., 2013). Growing concern over the abuse potential and addictive nature of opiates triggered the passage of the Harrison Narcotics Tax Act in 1914, which imposed restrictions on the production and distribution of opiates (Meldrum, 2003). Under the Harrison Act, physicians became gatekeepers for the flow of opiate medications (Alam & Juurlink, 2016). Critics of the Harrison Act noted that its regulations impacted the manufacture and sale of opiates, but exempted the

physician, “the greatest single factor in drug addict formation,” from legal scrutiny of their prescribing practices (Terry, 1915, p. 518). Indeed, prescribing practices would contribute to the growing number of opioid-dependent patients as medical attitudes toward the drugs evolved. In the late twentieth century, most physicians recognized the potential dangers of opioid medications and limited such prescriptions to the treatment of severe cancer-related pain, cautious of the development of opioid tolerance and dependence (Alam & Juurlink, 2016).

However, another shift in opiate prescribing practices took place in the 1990s as a result of evolving views on pain management in the medical field (Alam & Juurlink, 2016). Regular assessment and treatment of pain was established as the standard of care for physician visits, encouraging the widespread acceptance of pain as a “fifth vital sign” (Alam & Juurlink, 2016; Lynch, 2001, p. 85).

In pursuit of the worthy goal of pain management, clinicians prescribed opioids for a growing number of acute and chronic indications, while pharmaceutical companies encouraged such practices and understated the potential risks of the drugs (Alam & Juurlink, 2016). Considering pain as a vital sign, patients judged the quality of their physicians by how effectively their pain was managed. In addition, physicians have been subjected to increasing demands in terms of patient load, shortening the time available to counsel individual patients (Nathan, Cohen, & Vinker, 2017). On average, primary care providers (PCPs) spend only an hour with each patient, with a large portion (52%) of the physician’s daily workday engulfed by documentation (Arndt, Tuan, White, & Schumacher, 2014; Arndt et al., 2017). Physicians, with less than fifteen minutes to hear and address each patient’s concerns, found that prescribing opioids was the easiest and most effective means of treating patients complaining of pain. Between 1992 and 2010, the yearly dispensing of opioid medications steadily increased from

~102 million to ~270 million prescriptions (Pezalla, Rosen, Erensen, Haddox, & Mayne, 2017). Armed with a growing understanding of the addictive properties of opioid medications, proponents of cautious prescribing voiced their concerns about the growing number of prescriptions in the 2000s, leading to tightened regulation by state and federal agencies (Kolodny et al., 2015; Webster & Grabois, 2015).

State medical boards (SMBs) receive information regarding prescriptions written by physicians, enabling the licensing body to monitor the legitimate flow of opioid medications and identify any aberrant prescribing habits. SMBs may also engage in disciplinary action for problematic prescribers, an infrequent but increasingly common event (Dineen & DuBois, 2016). In 2013, the Federation of State Medical Boards developed a framework for chronic opioid treatment, calling for drug testing to ensure adherence to the treatment regimen and frequent consideration of discontinuing opioids (Webster & Grabois, 2015). Recognizing a problematic trend in opioid prescribing, the U.S. Centers for Disease Control and Prevention published new recommendations in 2016, limiting opioid prescriptions to seven days for acute pain and encouraging non-opioid therapy for chronic pain (Dowell, Haegerich, & Chou, 2016).

Mirroring the federal recommendations, several states are in the process of passing bills calling for provider education on the addictive properties of opioid medications, consistent use of prescription monitoring programs, and establishing prescription requirements for pharmacists and physicians (Knollenberg, 2017; Nevada Assembly Committee on Health and Human Services, 2017). As currently written, these bills contain restrictions on opioid prescribing, the violation of which are punishable by law (Knollenberg, 2017; Nevada Assembly Committee on Health and Human Services, 2017). In 2017, Ohio passed legislation limiting opioid prescriptions for acute pain to seven days for adults (five days for minors), among other

stipulations (State of Ohio Board of Pharmacy, 2017). Opioid prescription-related bills have been considered in more than 30 states as of 2018 (Blackman, 2017).

In the face of increasingly restrictive regulatory environments and social pressure from communities riddled with addiction, physicians curbed their prescribing habits, decreasing the number of opioid prescriptions dispensed by 16% since 2010 (Pezalla et al., 2017). This change in supply left many patients opioid-dependent but without a legitimate supply of medication or a referral to specialized treatment. In this context, the opioid-dependent population turned to illicit sources of opioids to quell their cravings and withdrawal symptoms. Today, less than a quarter of PPR misusers receive the medication from a physician, while others are left to secure pills from their contacts or turn to the black market (Substance Abuse and Mental Health Services Administration [SAMHSA], 2016a).

**The Opioid Crisis**

As more patients grew dependent upon the prescribed opioids, the reputation of the medications as a recreational high became more prominent on the black market (Meldrum, 2016). Heroin, a synthetic opioid originally manufactured by Bayer Pharmaceuticals in 1898, began to be produced on the streets as a cost-effective and highly accessible alternative to physician-prescribed opioids (Alam & Juurlink, 2016). The manufacture and distribution of synthetic opioids roughly coincided with the sudden realization of the severe impact of opioids on public health in the 2000s, leading to a deadly combination of existing opioid dependence, newly restrictive prescribing, and readily available (and dangerously unregulated) street alternatives. Street-manufactured synthetic opioids sought to deliver a more potent high, introducing life-threateningly strong drugs, including carfentanil.

Under these conditions, the number of deaths from opioid overdose began to climb, becoming an ever-worsening public health crisis. In the United States (U.S.), deaths due to opioid overdose increased by 15.6% between 2014 and 2015, and are still climbing (Rudd, Seth, David, & Scholl, 2016). The number of U.S. opioid deaths in 2016 exceeded 64,000, illustrating the epidemic proportions of this issue (Centers for Disease Control and Prevention, 2017). The opioid crisis continues to demand the attention of all available responders, including the expected health professionals, as well as law enforcement and fire personnel. In October 2017, after years of exponentially increasing numbers of overdose deaths related to opioid use, the President of the United States declared a nationwide public health emergency to address the opioid crisis, mobilizing federal resources to broaden treatment options and accessibility (Office of the Press Secretary, 2017).

**Local Perspective**

The author and editors of this discussion are based at Wright State University in Dayton, Ohio, a city ravaged by the opioid crisis in recent years. As detailed in *Dreamland* by Sam Quinones (2015), Columbus, Ohio served as the economic epicenter for the intersection of the black tar heroin and illicit prescription pain reliever industries, rippling outward to Southern Ohio and West Virginia. Dayton, in Montgomery County, is among the hardest hit by the epidemic. Montgomery County earned the unfortunate title “Overdose Capital of America” after seeing 362 overdose deaths in the first five months of 2017, the highest number of overdose deaths per capita in the United States (Soboroff, 2017, p. 1; Talbot & Montgomery, 2018).

Thankfully, deaths attributable to opioid abuse in Montgomery County have slowed toward the end of 2017, though the region still suffers (Stewart, 2018). The improvement is credited to the monumental efforts of local agencies, including Public Health - Dayton and

Montgomery County (PHDMC); Alcohol, Drug Addiction and Mental Health Services (ADAMHS); Families of Addicts; and Project C.U.R.E. (Community Overdose Action Team [COAT], 2017; Families of Addicts, 2018; Project C.U.R.E, 2018).

### Statement of Purpose

This project examines the demographic characteristics of recent prescription pain reliever (PPR) misusers in comparison to those currently enrolled in treatment for addiction, to identify any similarities and/or discrepancies between the two populations. In addition, reported reasons for treatment non-seeking are evaluated, identifying any demographic trends among each category of treatment barriers.

## Literature Review

### Demographic Profile of Opioid Users and Treatment-seekers

**Opioid users.** The lifetime prevalence of any drug use disorder, according to the National Epidemiologic Survey on Alcohol and Related Conditions (NESARC), is 9.9% (Grant et al., 2016). The most substantial subsets of drug use disorder patients are cannabis users (6.3% prevalence) and cocaine users (2.4%) (Grant et al., 2016). Opioid use disorder is the third most common subtype of drug use disorder in the United States, with a 2.1% prevalence (Grant et al., 2016).

Opioid users are a diverse group in terms of race, socioeconomic status, and treatment needs, among other characteristics. This heterogeneity emphasizes the need for clinicians treating addiction to make individualized treatment decisions while understanding the broader demography of this population. Though there is likely a significant amount of overlap, data exists for two distinct groups of opioid users: nonmedical users and prescription users.

***Nonmedical opioid users.*** A nonmedical opioid user is an individual who uses opioid drugs in a manner inconsistent with their prescription instructions or who uses illegal opioid formulation. Prevalence of nonmedical opioid use is higher in individuals with the following characteristics (Wu, Woody, Yang, & Blazer, 2010): age between 18 and 44, male sex, Caucasian race, family income under $70,000/year, and a family or personal history of substance abuse. NESARC offers insight into geographical patterns of drug use as well, noting that rates of lifetime drug abuse or dependence are higher among residents of the Western United States and lower in the South (Compton et al., 2007).

Additional demographic characteristics studied in association with nonmedical opioid use include sexual identity, marital status, and education levels. In a study of college students, lesbian, gay, or bisexual (LGB) students reported nonmedical opioid use at a rate 1.78 times higher than their heterosexual peers (Dagirmanjian, McDaniel, & Shadick, 2017). In addition, LGB individuals are shown to initiate misuse of all prescription drugs earlier in life and more frequently when compared to the sexual majority (Kecojevic et al., 2012). This association is noted in the context of heightened rates of childhood abuse in the LGB population (Kecojevic et al., 2012). Childhood abuse is one example of an adverse childhood experience (ACE). ACEs are associated with a myriad of poor health outcomes later in life, including substance use and addiction (Brockie, Dana-Sacco, Wallen, Wilcox, & Campbell, 2015; Dube, Felitti, Dong, Giles, & Anda, 2003; Reuben et al., 2016).

Marriage appears to be a protective factor against the development of mental illness, though data on addiction specifically is limited (Williams, Frech, & Carlson, 2010). Stable marriage is hypothesized to enhance mental health by maximizing psychosocial resources in the context of the family and providing an individual with meaning and purpose (Williams et al.,

2010). Exiting marriage constitutes an emotional stress that is linked to poorer mental health and increased risk of mortality from suicide in divorced men when compared to married men (RR = 2.38; 95% CI 1.58,2.72) (Kposowa, 2000). Divorced women did not demonstrate heightened risk compared to married women (Kposowa, 2000). For both genders, marital loss (divorce or widowhood) is linked to higher rates of depression, which is in turn linked to a 1.8 to 2.4 times higher rate of PPR misuse among patients with PPR prescriptions (Grattan, Sullivan, Saunders, Campbell, & Von Korff, 2012; Simon, 2002).

The association between educational attainment and substance use has been studied in the adolescent population. Adolescents with poor academic performance are more likely to use tobacco, marijuana, cocaine, and alcohol and less likely to pursue higher education (Bachman et al., 2008). In addition, substance use is associated with worsening academic performance, suggesting a bidirectional relationship between these two variables (Bachman et al., 2008). Gender and level of education combine to have a differential effect on use of hypnosedative medications, including opioids. In women, primary education was associated with a 21% rate of hypnosedative use (95% CI 16.9, 25.8) compared to a 11.1% rate (95% CI 9.4, 13.1) in females with higher education (Teixidó-Compañó et al., 2018). Education level did not significantly affect hypnosedative abuse among men (Teixidó-Compañó et al., 2018).

Illicit opioid users are a subset of nonmedical users whose drug of choice is an illegal opioid formulation, including heroin. Heroin users are more likely to be of African-American race and older than primary nonmedical users, who use legal prescription drugs in a manner inconsistent with physician instructions (Wu et al., 2010). Interestingly, Ohio data contradicts the national findings of NESARC regarding the racial demographics of heroin users. In a 2016 report by PHDMC, 90% of naloxone administrations were given to Caucasian patients

(Epidemiology Section of Public Health - Dayton and Montgomery County & Ebron, 2016). Though naloxone administration does not necessarily reflect the prevalence of heroin misuse, the discrepancy between national and local data suggests a great deal of regional variability in the racial profile of heroin users.

Other characteristics of heroin users include age between 18 and 25, residence in an urban area, family income under $20,000/year, lack of health insurance, and abuse of other substances (Jones, Logan, Gladden, & Bohm, 2015). Though the demographics of primary nonmedical users and heroin users vary slightly, young adult males seem to comprise the majority of the nonmedical users, based on the data available (Jones et al., 2015; Wu et al., 2010). This demographic overlap between abusers of PPRs and heroin abusers suggests that unsanctioned use of prescription opioids is a significant risk factor for heroin use and that the transition to illicit use is relatively unhindered (Compton, Jones, & Baldwin, 2016)

***Prescription opioid users.*** Though illicit opioid use is rampant, it is worthwhile to review the characteristics of patients with legitimate opioid prescriptions who use them according to physician instructions. Regular users of legitimately obtained opioids are more likely to exhibit the following characteristics: no high school diploma, female sex, older age (over 55), previous psychiatric diagnosis, and polypharmacy (five or more non-opioid prescription medications) (Figure 1) (Kelly et al., 2008).

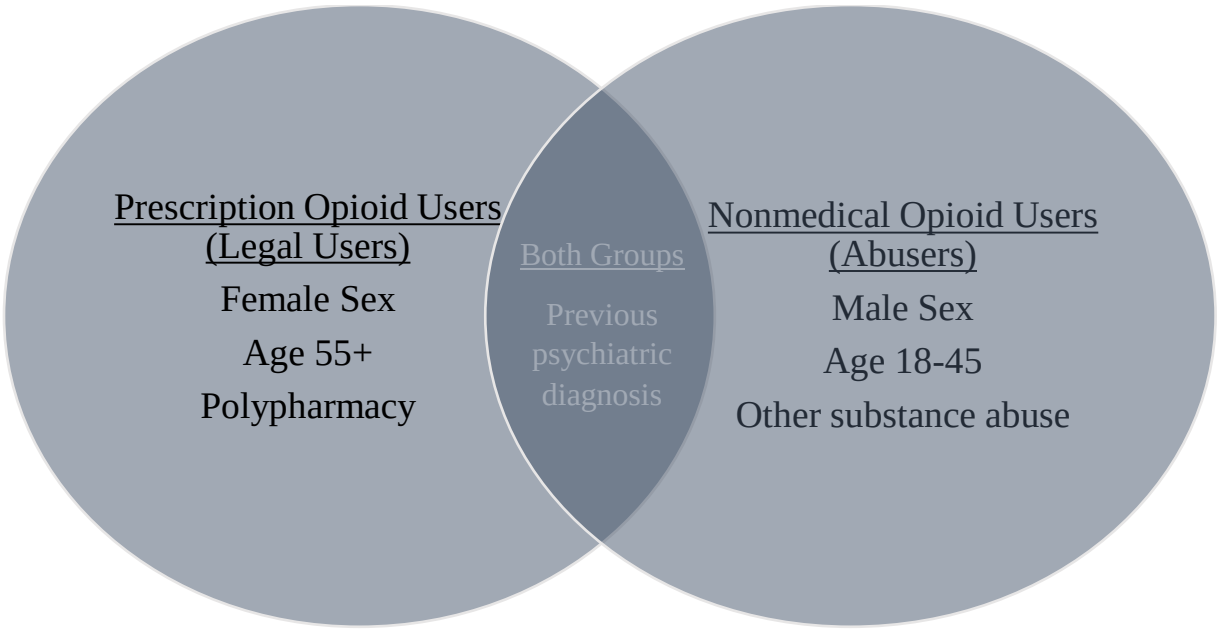


*Figure 1*. Comparison of legal prescription opioid users and nonmedical opioid users (abusers).

**Treatment seekers.** Only a small portion of the opioid-using population has the access and motivation to seek and treatment for opioid dependence. According to NESARC, only 8.1% of the drug abusing population had ever enrolled in treatment (Compton et al., 2007). For the drug-dependent population, the treatment rate was 37.9%, which offers hope that a more substantial portion of frequent and heavy users are seeking treatment (Compton et al., 2007). The most common treatments pursued by these individuals were provided by health care professionals and self-help groups, such as Narcotics Anonymous (Compton et al., 2007).

Data on the demographic characteristics of treatment seekers compared to non-treatment seekers is somewhat scarce. NESARC data identifies no social or demographic factors that influence treatment-seeking behavior, though lifetime incidence of such behavior is more common among the widowed or divorced and among those in the lowest income bracket (Compton et al., 2007). One study elucidates the characteristics of first-time treatment seekers compared to those with one or more prior treatment experiences for alcohol addiction, which

may offer insight into the types of patients likely to have strong motivation for substance abuse treatment (LoCastro, Potter, Donovan, Couper, & Pope, 2008). First-time treatment seekers, research shows, are more likely to be socioeconomically stable, married, employed, and female (LoCastro et al., 2008). Interestingly, age and race do not seem to be positively or negatively associated with treatment-seeking (LoCastro et al., 2008).

## Barriers to Treatment

**Stigmatization of addiction.** Many patients suffering with addiction fear seeking treatment because of the perception of negative attitudes toward addiction held by colleagues, family, friends and other community members. The public attitude toward mental illness is not to condemn, but to recognize it as a condition worthy of humanistic intervention (Angermeyer & Dietrich, 2006). However, addiction as a subcategory of mental illness is more commonly met with rejection and blame when compared to other conditions, such as depression or anxiety alone, though monumental public health efforts are working to reverse the stigma (Angermeyer & Dietrich, 2006; Corrigan, Kuwabara, & O'Shaughnessy, 2009). These negative attitudes appear to be linked to uncertainty and fear surrounding the behaviors of addicted patients (Angermeyer & Dietrich, 2006).

Unfortunately, health care providers are not immune to negative attitudes toward addiction. Though the opinions and beliefs of individual providers vary greatly, the general attitude of physicians toward patients with substance use disorders is negative (van Boekel, Brouwers, van Weeghel, & Garretsen, 2013). Factors contributing to the stigma held by providers include the emotionally challenging nature of managing addiction, the perception of patients with addiction as manipulative or poorly motivated, and the feelings of futility and powerlessness to affect change that often accompany addiction (Chang, Dubbin, & Shim, 2016;

van Boekel et al., 2013). Some providers describe addicted patients as high maintenance, difficult to work with, and resistant to treatment, perpetuating the stigmatization of this vulnerable population (DeFlavio, Rolin, Nordstrom, & Kazal, 2015; Lundgren, Chassler, Amodeo, D'Ippolito, & Sullivan, 2012).

The impact of provider stigmatization of addiction goes beyond simple discomfort during the patient-provider interaction, negatively affecting patient care. Patients who perceive negative attitudes or discriminatory practices from their physicians are less likely to complete treatment as a result of poor patient empowerment and subconscious effects on self-esteem (van Boekel et al., 2013). Poor self-image can contribute to decreased perceptions of self-efficacy, an important quality in the management of addiction. The tension that bias places on the patient-provider relationship diminishes personal engagement for both parties, leading to suboptimal provision of care and decreased patient morale (van Boekel et al., 2013).

***Fear.*** When considering seeking treatment for addiction, substance-dependent patients face great fear and uncertainty. Chung and Shek (2018) found that self-reported addicts express fear of several aspects of treatment, illustrated in Figure 2. Treatment-related fears fall into the general categories of program-related (maladaptation to treatment), emotional, and social factors.

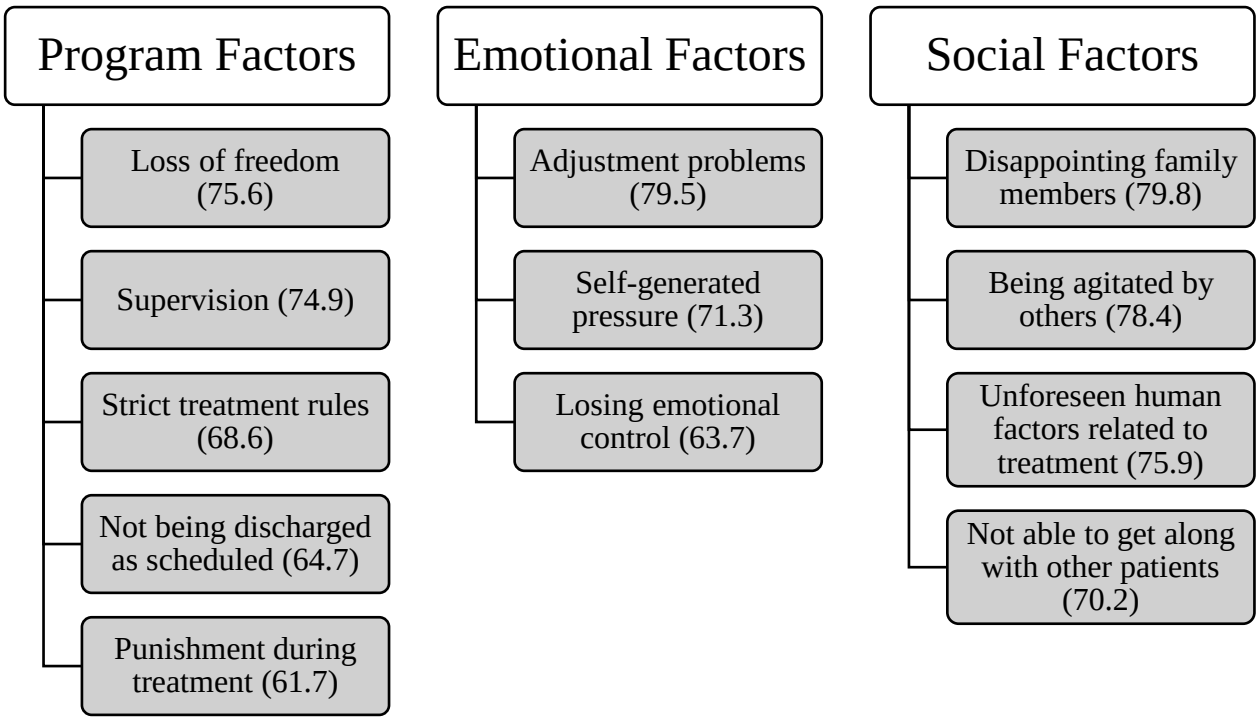


*Figure 2.* Fears related to treatment seeking, from Chung and Shek (2018) (percent of respondents verifying fear, *n* = 303).

These fears associated with treatment-seeking create a negative, ominous image of professional help in the minds of substance-dependent patients. This leads to a large portion of patients (72.6%) reporting a preference to handle their mental health or substance use problem on their own, without professional intervention (Sareen et al., 2007).

Opioid-dependent patients may also fear the notoriously uncomfortable physical sensations associated with detoxification and reduction/cessation of use (Dugosh et al., 2016; Reeve et al., 2013; Stone, 2015).

**Attitudinal factors.** Personal beliefs and attitudinal factors have been studied as barriers to mental health access, though data on attitudes surrounding specific addiction treatment is scarce. The single most commonly reported reason for not seeking treatment among patients with documented mental illness (including substance use disorder) of any severity is low perceived need (44.8% of respondents) (Mojtabai et al., 2011).

A substantial majority (97.4%) of mental health patients who recognize the need for treatment cite at least one attitudinal barrier, including perceptions of low problem severity, treatment ineffectiveness, and social stigmatization (Mojtabai et al., 2011). Structural barriers (financial, availability, transportation, and inconvenience) were reported by less than a fourth of mental health patients (Mojtabai et al., 2011).

***Financial access.*** Individuals with mental illness are statistically less likely to have adequate health insurance and mental health diagnoses are commonly comorbid with substance use disorders (Rowan, McAlpine, & Blewett, 2013). Thus, lack of health insurance is a substantial financial barrier for mentally ill or substance-dependent patients seeking treatment. As the most significant payer for mental health services in the United States, Medicaid thankfully reduces the economic burden of mental health treatment on the patients themselves, though cost is still a concern of many insured patients (Rowan et al., 2013). The perception of cost as a barrier increases in intensity with severity of mental illness, suggesting that the patients most in need of assistance are least likely to be able to afford treatment (Rowan et al., 2013). This discrepancy is highlighted when low-income individuals in the United States are compared to those in other countries (Sareen et al., 2007). Americans are more likely than both Canadians (AOR = 9.19, 95% CI 3.79, 22.30) and Dutch (AOR = 8.09, 95% CI 4.51, 14.52) to report any financial concern as a barrier to mental health treatment (Sareen et al., 2007).

While patients may struggle to cover the cost of treatment, providers of addiction treatment face financial barriers in rendering services for substance use. In light of the recent rise in opioid dependence, PCPs have been encouraged to broaden their scope of practice to include medication-assisted treatment (MAT) for opioid and alcohol use disorders. However, in many cases, PCPs are not adequately compensated for the additional workload of patients with

addiction, limiting treatment capacity. Billing and reimbursement concerns are one of the most significant barriers cited by health agency directors and clinical supervisors attempting to provide addiction treatment services (McGovern, Xie, Segal, Siembab, & Drake, 2006). Financial incentives, supported by policy changes, may facilitate the adoption of addiction screening and treatment by PCPs (Hostetter & Klein, 2017). Investment in such incentives may be encouraged by further research demonstrating the economic favorability of addiction treatment and the potential savings in other areas (Hostetter & Klein, 2017).

***Geographical access***. Even if finances are not a barrier to mental health care, some patients are geographically separated from treatment facilities, posing another barrier to access. Addiction treatment programs require multiple visits if the patient chooses to continue treatment in pursuit of his or her personal goals. Transportation to these visits may be a challenge for some patients. Lack of readily available and reliable transportation decreases convenience and contributes to poor health care utilization (Syed, Gerber, & Sharp, 2013). Though research shows wide variance in the percentage of patients citing transportation as a barrier to health care access, there is a consistent portion of the general patient population without reliable transportation, especially in rural settings (Syed et al., 2013). In fact, lack of transportation is the most commonly reported challenge to accessing care, according to patient surveys (O'Brien, Wielunksi, Ruppel, Stoimenoff, & Gomez, 2016; Syed et al., 2013).

Given the frequency of mental health comorbidities in opioid-dependent patients, transportation may be an even more difficult barrier to overcome in this unique population. SAMHSA describes potential initiatives for increasing patient access to transportation that may be implemented alongside MAT programs to enhance treatment outcomes, including half-fare programs for public transit or volunteer-run transportation services (SAMHSA, 2004). Non-

emergency medical transportation is available to eligible individuals insured through Medicaid, though patients may be unaware of these benefits (Centers for Medicare and Medicaid Services, 2016).

Access to treatment varies depending on urban or rural residence. Barring financial concerns, urban settings tend to have a wider array of services available in close geographic proximity to potential patients, while rural residents may struggle to find a treatment facility in close proximity to their homes (Harley & Kim, 2018). The majority of opioid treatment programs are location in urban areas, leaving rural residents with treatment options limited in scope and intensity (Harley & Kim, 2018).

PPR misusers are diverse and face a number of barriers when making the decision to seek substance abuse treatment. This analysis aims to explore the demographic profile of PPR misusers and the characteristics that are associated with treatment-seeking. In addition, reported reasons for treatment non-seeking are evaluated, identifying any demographic trends among each category of treatment barriers.

## Methods

This study used a secondary analysis of the publicly-available dataset gathered by the Center for Behavioral Health Statistics and Quality (CBHSQ) through the National Survey of Drug Use and Health (NSDUH) in the year 2015 (https://nsduhweb.rti.org/).

This study is exempt from IRB evaluation, per 45 CFR part 46 of the Human Subjects Regulations Decision Chart 1 (Appendix A). NSDUH does provide information about living individuals, but this study did not entail any intervention or interaction with the survey respondents and the data was de-identified. All calculations were performed in Microsoft Excel 2016.

**PPR Misusers and Treatment Enrollees**

Patterns of prescription pain reliever (PPR) misuse are diverse, but for ease of analysis, active PPR use was compared only to absent lifetime PPR use (or 'never-use'). Active PPR misuse was defined as use in the past 30 days. All substance misuse data collected by NSDUH is self-reported, with no external validation of use.

To obtain a demographic profile of PPR users, pivot tables were constructed, comparing PPR use to select demographic characteristics. Using these tables, the prevalence of PPR misuse and current treatment was calculated. Demographic characteristics were selected based on survey availability and comparability to existing literature. Selected characteristics (and selected subcategories) are shown below (Table 1). Noted variables under each characteristic were excluded for ease of analysis and scope manageability.

Table 1

*Selected Demographic Characteristics from National Survey on Drug Use and Health 2015*

| Demographic Characteristic | Response Categories | Excluded Variables |
|---|---|---|
| **Sexual Identity** | - Heterosexual<br>- Homosexual | - Bisexual |
| **Sex** | - Male<br>- Female | - n/a |
| **Marital Status** | - Never Married<br>- Divorced<br>- Widowed<br>- Married | - n/a |
| **Education (highest level obtained)** | - High school<br>- Some college<br>- College graduate | - Fifth, sixth, … eleventh grade completed; Associate's degree |
| **Age (years)** | - 12-17<br>- 18-25<br>- 26-34<br>- 35-49<br>- 50-64<br>- 65+ | - n/a |

Table 1 (Continued)

| Demographic Characteristic | Response Categories | Excluded Variables |
|---|---|---|
| **Race** | - White<br>- Black<br>- Hispanic | - Native American/Alaska Native, Native Hawaiian/Other Pacific Islander |
| **Total Family Income (thousands of dollars per year)** | - <10<br>- 10-19<br>- 20-29<br>- 30-39<br>- 40-49<br>- 50-74<br>- 75+ | - n/a |

The selected demographic characteristics were also studied among patients seeking treatment for addiction to drugs or alcohol. Treatment engagement was gauged by analyzing responses to the survey question “Are you currently receiving treatment or counseling for your [addiction]?” The number of positive responses to this general question pertaining to drug and/or alcohol treatment ($n$ = 3,342) is much larger than those reporting treatment for prescription pain reliever addiction ($n$ = 348), allowing for a larger body of information in the analysis. Comparing the opioid-using population to the general pool of addicted patients in treatment still offers insight into demographic trends predicting treatment engagement.

Further analysis entailed calculating odds ratios among PPR users with certain subcategory characteristics and investigation of underlying reasons for the increased or decreased proportion of treatment engagement in that population. Chi-square tests were performed as appropriate on binomial categorical variables, assuming normal distribution of values. For chi-square testing of independence, recent PPR misusers were compared to individuals who report never misusing PPRs to explore relationships between demographic

characteristics and PPR abuse. Alpha (α) was set at 0.05 for determination of statistical significance.

**Reported Barriers to Treatment**

The NSDUH provides some data on the reasons respondents cite for not seeking treatment for their problematic substance use. Selection of multiple reasons was allowed. For this analysis, specific responses from NSDUH were recoded into general categories representing different barriers to access (Table 2).

Table 2

*Barriers to Treatment – Recoded Variables*

| **Original Barrier Cited** | **Recode** | **Subcategory (if applicable)** |
|---|---|---|
| No health insurance | Financial | |
| Treatment not covered on health insurance plan | | |
| Not willing to stop using | Personal | Opinion of Use |
| Thought they could handle it on their own | | |
| Didn't think they needed treatment | | |
| Didn't think treatment would help | | Opinion of Treatment |
| Unaware of treatment options | | Lack of Knowledge of Treatment Options |
| Fear of social stigma | | Social Concerns |
| Didn't want others to know they needed treatment | | |
| Fear that treatment will interfere with job | | Employment/Other Responsibilities |
| Patient didn't have time due to other commitments | | |
| No openings in the programs | Program Availability | |
| Appropriate treatment not found | | |
| Lack of transportation, inconvenient distance | Transportation | |

Frequency of each general category of reasons for not seeking treatment among those respondents who reported recent substance abuse was calculated. In addition, subcategories of ‘personal’ reasons were expressed as sub-percentages of that group.

## Results

Only 5.49% of NSDUH 2015 respondents indicated ever-abusing PPRs, which limited the sample size available for analysis of PPR use specifically. Chi-square tests of independence comparing recent PPR misusers to individuals who report never-misuse allowed for the use of a larger number of data points, since the majority of survey respondents (93.47%) answered the question regarding lifetime PPR misuse.

### Demographic Profile of PPR Misusers and Treatment Enrollees

Demographic characteristics of PPR misusers were compared to individuals who are currently enrolled in treatment (Table 3). Values represent the percentage of individuals with the noted characteristic who also meet the criteria for recent PPR misuse and current treatment. For example, 1.59% of heterosexual respondents report recent PPR misuse.

Table 3

*Prevalence of PPR Misuse and Treatment Enrollment by Demographic Characteristic*

| **Characteristic** | **Subcategory** | **% of subcategory reporting recent PPR misuse (*n* = 942)** | **% of subcategory currently enrolled in addiction treatment (*n* = 388)** |
|---|---|---|---|
| **Sexual Identity** | Heterosexual | 1.59 | 0.73 |
| | Homosexual | 2.56 | 2.00 |
| **Gender** | Male | 1.68 | 0.80 |
| | Female | 1.36 | 0.57 |
| **Marital Status** | Never married | 1.84 | 0.91 |
| | Divorced | 2.24 | 1.34 |
| | Widowed | 1.77 | 0.95 |
| | Married | 1.11 | 0.38 |
| **Education (highest level obtained)** | High school/GED | 1.95 | 1.02 |
| | Some college | 1.96 | 0.92 |
| | College graduate | 0.98 | 0.29 |
| **Age (years)** | 12-17 | 0.88 | 0.28 |
| | 18-25 | 2.16 | 0.76 |
| | 26-34 | 2.00 | 1.25 |
| | 35-49 | 1.61 | 0.86 |
| | 50-64 | 1.09 | 0.52 |
| | 65+ | 0.28 | 0.08 |
| **Race** | White | 1.66 | 0.80 |
| | Black | 1.13 | 0.33 |
| | Hispanic | 1.41 | 0.51 |
| **Total Family Income (thousands of dollars per year)** | <10 | 1.87 | 1.25 |
| | $10-19 | 2.00 | 1.01 |
| | 20-29 | 1.89 | 0.94 |
| | 30-39 | 1.71 | 0.71 |
| | 40-49 | 1.40 | 0.30 |
| | 50-74 | 1.47 | 0.58 |
| | 75+ | 1.07 | 0.47 |

**Sexual identity.** The odds of PPR misuse among homosexuals is 1.19 times higher than that of heterosexual respondents (OR 1.19; 95% CI 0.74, 1.93). However, this finding is not statistically significant, as the 95% confidence interval includes one.

A chi-square test of independence was performed to analyze the relationship between sexual identity (heterosexual or homosexual) and recent PPR misuse (compared to never-misuse). A significant relationship was discovered, $\chi 2(1, N = 36{,}484) = 7.06$, $p < .01$. Homosexuals were more likely to report recent PPR misuse.

**Gender.** Though the prevalence findings in Table 3 suggest only a minute difference in the prevalence of PPR misuse in males (1.68%) compared to females (1.36%), the odds of PPR misuse was found to be 1.26 higher in males (OR 1.26; 95% 1.10, 1.44). Chi-square testing of independence supports this finding, showing a significant relationship between gender and recent PPR misuse, $\chi 2$ (1, $N = 51{,}089$) = 11.159, $p < .01$. This data demonstrates that males are more likely than females to report PPR misuse.

**Marital status.** Current marriage appears to be protective against misuse, with only 1.11% of married respondents reporting PPR misuse compared to 1.84% of never-married respondents. The odds of PPR misuse among divorcees is 1.73 higher than those who have never married (OR 1.73; 95% CI 1.34, 2.24). Among married respondents, the odds of PPR misuse is 1.31 times higher than single respondents (OR 1.31; 95% CI 1.07,1.59).

**Education.** College education appears to be a protective factor for PPR misuse when compared to only a high school diploma or GED (OR 0.76; 95% CI 0.58, 0.99).

**Age.** The 18-25 age range comprises a larger percentage of PPR misusers (36.43%) than treatment enrollees (28.35%), though age is somewhat evenly distributed between 18-49 in both populations (Figure 3).

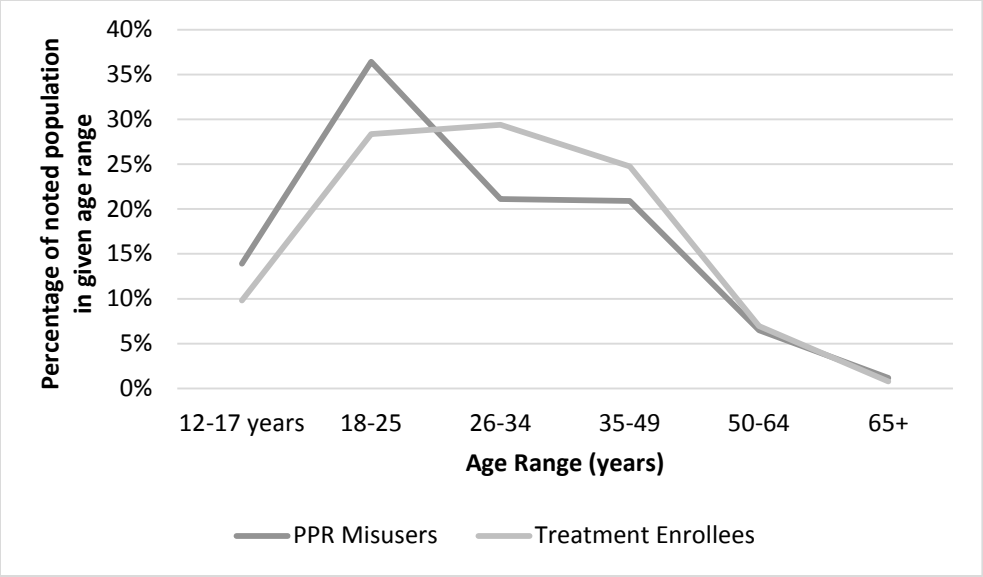


*Figure 3.* Age distribution of PPR misusers and treatment enrollees.

**Race.** Compared to Whites, Blacks are 1.33 times more likely (95% CI 1.026, 1.75) and Hispanics 1.6 times more likely (95% CI 1.26, 2.02) to misuse PPRs. Because the 95% confidence intervals for these odds ratios do not include 1, these differences are statistically significant.

Despite the heightened prevalence of PPR misuse among minorities, Blacks and Hispanics do not comprise a proportional segment of those enrolled in treatment. Blacks are 2.72 times more likely (95% CI 1.65, 4.52) not to be in treatment when compared to Whites, while Hispanics are 1.55 times more likely (95% CI 1.05, 2.30).

**Income.** There are no outstanding differences in income among PPR misusers when compared to treatment enrollees, though more than one-fifth of both populations are comprised of relatively wealthy individuals making more than $75,000 per year (Figure 4).

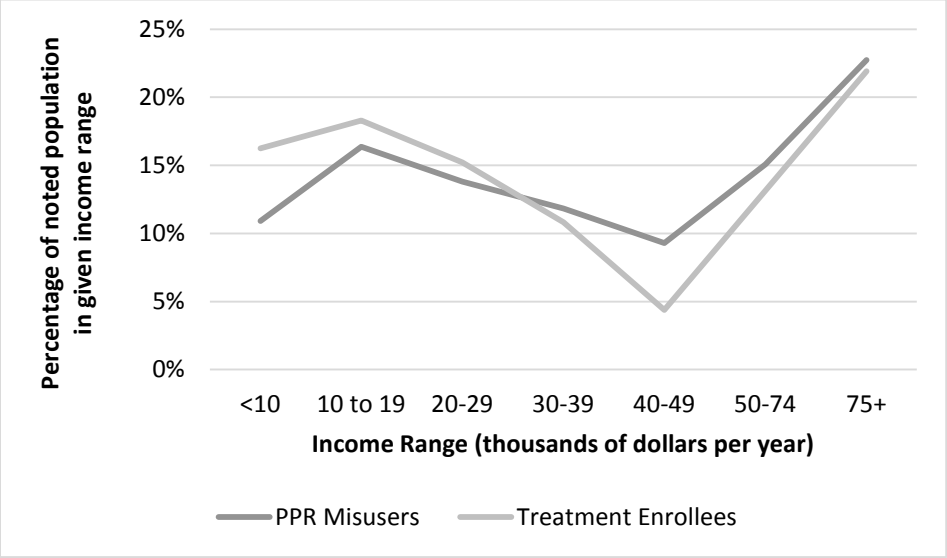


*Figure 4.* Distribution of income range among PPR misusers and treatment enrollees.

**Comparison between PPR Misuse and Treatment Enrollment**

Examining the most highly represented group in each demographic subcategory, we can gain an understanding of any discrepancies between the populations of PPR misusers compared to treatment enrollees (Table 4).

Table 4

*Comparison of the Most Highly Represented Demographic Characteristics of PPR Misusers and Treatment Enrollees*

| **Characteristic** | **Most highly represented subcategory among:** | |
|---|---|---|
| | **PPR Misusers** | **Treatment Enrollees** |
| Sexual Identity | Homosexual | Homosexual |
| Gender | Male | Male |
| Marital Status | Divorced | Divorced |
| Education | **Some College** | **High School/GED** |
| Age (years) | **18-25** | **26-34** |
| Race | White | White |
| Total Family Income (thousands of dollars per year) | **10-19** | **<10** |

*Note.* Bolded fields represent discrepancies between the analyzed populations.

**Reported Barriers to Treatment**

Four hundred and forty-one (441) respondents denied seeking treatment despite recent substance use. Three hundred and seventy-four (374) responses citing a reason for non-treatment-seeking were recorded. Among the 374 responses from non-treatment seekers, 257 (68.72%) reported personal reasons, 73 (19.52%) cited financial reasons, 25 (6.68%) cited transportation concerns, and 19 (5.08%) reported program availability factors (Figure 5).

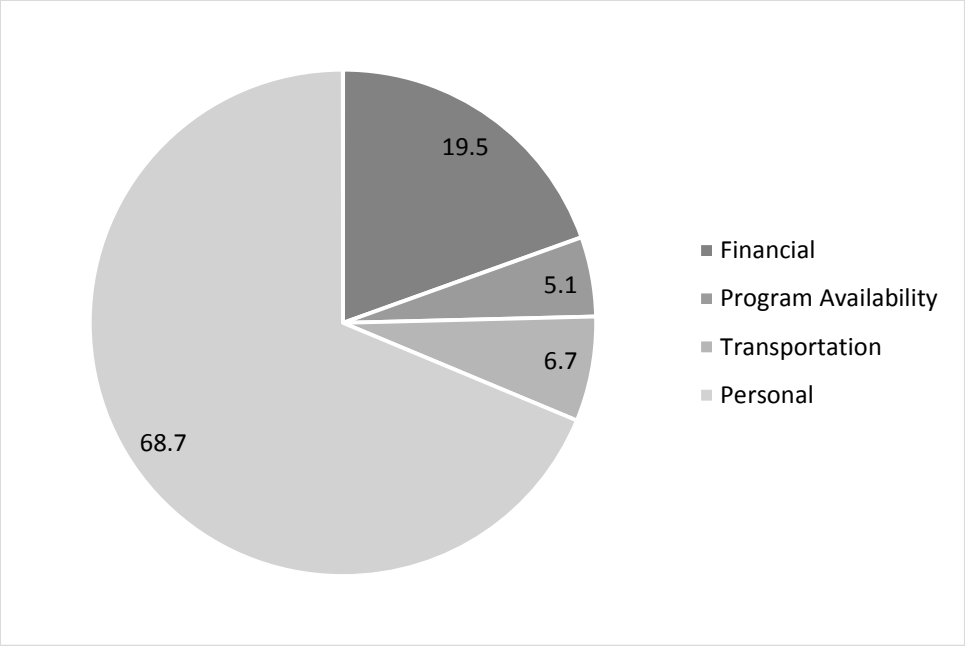


*Figure 5.* Reasons cited for not seeking treatment for addiction (percentage of respondents).

Personal reasons comprised over two thirds of responses, warranting further investigation. The majority of users in this category (*n* = 134, 52.2%) avoided treatment enrollment based their personal opinions and feelings towards their substance use. These users were not ready/willing to stop using, didn't believe their use required treatment, or believed that they could manage their use without professional interevention. Other subcategories of personal reasons for avoiding treatment include social concerns (*n* = 47, 18.3%), employment and other responsibilities (*n* = 40, 15.6%), and opinions of treatment efficacy (*n* = 7, 2.7%) (Figure 6).

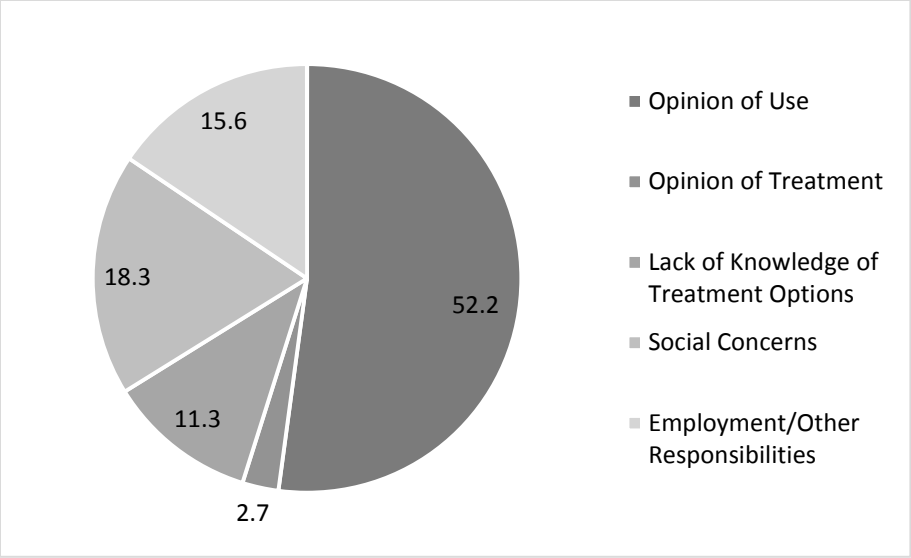


*Figure 6.* Subcategories within "personal" reasons for not seeking treatment (percentage of respondents citing personal reasons).

**Barriers to treatment by demographic.** Exploring each category of reasons for avoiding addiction treatment by demographic characteristic allows for comparison. Table 5 shows the percentage of individuals bearing a certain demographic characteristic reporting each category of barriers to treatment. The same information is visualized in a series of charts in Appendix B.

Table 5

*Percentage of Demographic Subcategory Reporting Each Type of Reason for Not Seeking Treatment*

| **Category** | **Subcategory** | ***n* of subcategory** | **Financial (%)** | **Personal (%)** | **Program (%)** | **Transport (%)** |
|---|---|---|---|---|---|---|
| **Sexual Identity** | Heterosexual | 301 | 18.6 | 69.8 | 4.3 | 7.3 |
| | Homosexual | 11 | 18.2 | 45.5 | 27.3 | 9.1 |
| **Gender** | Male | 188 | 20.2 | 67.0 | 6.4 | 6.4 |
| | Female | 186 | 18.8 | 70.4 | 3.8 | 7.0 |
| **Marital Status** | Never married | 229 | 18.3 | 68.1 | 6.1 | 7.4 |
| | Divorced | 47 | 25.5 | 61.7 | 6.4 | 6.4 |
| | Widowed | 19 | 15.8 | 84.2 | 0.0 | 0.0 |
| | Married | 72 | 20.8 | 69.4 | 2.8 | 6.9 |
| **Education (highest level obtained)** | High school/GED | 98 | 19.4 | 72.4 | 3.1 | 5.1 |
| | Some college | 123 | 18.7 | 68.3 | 5.7 | 7.3 |
| | College graduate | 32 | 21.9 | 62.5 | 6.3 | 9.4 |
| **Age (years)** | 12 to 17 | 17 | 17.6 | 82.4 | 0.0 | 0.0 |
| | 18-25 | 132 | 14.4 | 72.0 | 6.8 | 6.8 |
| | 26-34 | 120 | 21.7 | 65.8 | 3.3 | 9.2 |
| | 35-49 | 75 | 25.3 | 66.7 | 5.3 | 2.7 |
| | 50-64 | 26 | 19.2 | 69.2 | 3.8 | 7.7 |
| | 65+ | 4 | 25.0 | 25.0 | 25.0 | 25.0 |
| **Race** | White | 229 | 16.2 | 72.5 | 4.8 | 6.6 |
| | Black | 49 | 26.5 | 61.2 | 4.1 | 8.2 |
| | Hispanic | 54 | 25.9 | 63.0 | 7.4 | 3.7 |
| **Total Family Income (thousands of dollars per year)** | <10 | 50 | 16.0 | 70.0 | 4.0 | 10.0 |
| | $10-19 | 82 | 28.0 | 56.1 | 6.1 | 9.8 |
| | 20-29 | 42 | 16.7 | 66.7 | 9.5 | 7.1 |
| | 30-39 | 49 | 24.5 | 65.3 | 4.1 | 6.1 |
| | 40-49 | 47 | 17.0 | 72.3 | 8.5 | 2.1 |
| | 50-74 | 56 | 17.9 | 73.2 | 3.6 | 5.4 |
| | 75+ | 48 | 10.4 | 85.4 | 0.0 | 4.2 |

Given the prevalence, a demographic analysis of each subtype of personal reasons is justified (Table 6). Again, values represent percentage of the demographic subcategory citing the

noted reason. The sample size of individuals bearing each demographic characteristic is shown in the previous table.

Table 6

*Subtype of Personal Reasons Cited, by Demographic Characteristic*

| Category | Subcategory | Opinion of Use (%) | Opinion of Tx (%) | Unaware of Tx Options (%) | Social Concerns (%) | Other Resp. (%) |
|---|---|---|---|---|---|---|
| **Sexual Identity** | Heterosexual | 40 | 3 | 12 | 23 | 22 |
| | Homosexual | 33 | 0 | 33 | 33 | 0 |
| **Gender** | Male | 47 | 3 | 14 | 17 | 19 |
| | Female | 35 | 4 | 14 | 28 | 19 |
| **Marital Status** | Never married | 19 | 6 | 19 | 30 | 27 |
| | Divorced | 27 | 5 | 18 | 27 | 23 |
| | Widowed | 47 | 0 | 7 | 33 | 13 |
| | Married | 74 | 0 | 9 | 7 | 10 |
| **Education (highest level obtained)** | High school/GED | 39 | 4 | 11 | 22 | 24 |
| | Some college | 38 | 6 | 19 | 23 | 14 |
| | College graduate | 67 | 0 | 11 | 11 | 11 |
| **Age (years)** | 12 to 17 | 50 | 0 | 0 | 50 | 0 |
| | 18-25 | 34 | 6 | 18 | 25 | 16 |
| | 26-34 | 44 | 3 | 9 | 20 | 23 |
| | 35-49 | 43 | 0 | 14 | 19 | 24 |
| | 50-64 | 57 | 0 | 14 | 14 | 14 |
| | 65+ | 0 | 0 | 100 | 0 | 0 |
| **Race** | White | 42 | 1 | 16 | 23 | 18 |
| | Black | 43 | 13 | 13 | 13 | 17 |
| | Hispanic | 33 | 3 | 13 | 23 | 27 |
| **Total Family Income (thousands of dollars per year)** | <10 | 42 | 4 | 8 | 23 | 23 |
| | $10-19 | 34 | 0 | 8 | 32 | 26 |
| | 20-29 | 43 | 0 | 22 | 17 | 17 |
| | 30-39 | 27 | 12 | 19 | 23 | 19 |
| | 40-49 | 35 | 3 | 16 | 26 | 19 |
| | 50-74 | 48 | 0 | 19 | 19 | 13 |
| | 75+ | 55 | 6 | 9 | 15 | 15 |

*Note.* Tx = treatment, Resp. = responsibilities.

# Discussion

## Demographic Findings

**Sexual identity**. Consistent with the literature, sexual minorities are more likely to report PPR misuse (Kecojevic et al., 2012; Dagirmanjian et al., 2017)**.** One hypothesized reason for this association is the increased incidence of childhood abuse among LGB individuals, creating lifelong psychological distress that predisposes to substance abuse as a coping mechanism.

**Gender.** This analysis supports the well-studied notion that men are two to three times more likely to engage in substance abuse when compared to women, though female patients progress more quickly in their addiction and seek treatment earlier (Becker & Hu, 2008; Hernandez-Avila, Rounsaville, & Kranzler, 2004). The higher prevalence of substance abuse disorders among men is thought to be linked to increased risk-taking behavior in males (Becker, McClellan, & Reed, 2017; Charness & Gneezy, 2012). Though men are overrepresented in treatment enrollment in this study, recovery outcomes are similar between genders after completing a program for the treatment of addiction (Becker et al., 2017).

**Marital status.** Compared to singlehood, marriage appears to confer protection against PPR misuse while divorce is associated with an increased likelihood of abuse. Widowhood and singlehood show similar rates of PPR misuse and treatment enrollment. This suggests that marital loss (divorce or widowhood) alone does not increase the likelihood of PPR misuse, but divorce specifically is a risk factor.

As noted above, marriage is thought to protect against substance abuse and other risky behavior by providing the individual with a sense of purpose, trust, and responsibility (Williams et al., 2010). Conversely, the dissolution of a marriage through divorce is an emotional stress that

can be detrimental to mental health, predisposing an individual to substance abuse (Williams et al., 2010).

Interestingly, marital separation does not affect only the divorcee, but the children of the divorced couple. Marital conflict and divorce mediates substance use and other delinquent behaviors in children and adolescents by compromising the emotional support system and reducing the stringency of parental monitoring (Vanassche, Sodermans, & Matthijs, 2014).

**Education.** College educated individuals are less likely to misuse PPRs, while those with only a high school education or GED show a higher rate of misuse. Potential explanations for this finding include:

- Higher levels of education may confer a heightened awareness of the dangers of substance abuse, discouraging initiation of use.
- College education may lead to employment with better health-related benefits and a stronger workplace support system, protecting against substance abuse.
- Lower education levels may correlate with a decreased likelihood of engaging with preventive medicine (Zhang, Too, & Irwin, 2000), distancing those with a high school education or GED from wellness services that might circumvent substance use.

**Age.** Adolescents represent a high-risk population for substance use given their neurodevelopmental stage. Further increasing the risk of adult substance abuse and dependence among adolescents is the initiation of substance use during childhood or adolescence (Grant, Stinson, & Harford, 2001). Though alcohol and marijuana are the most commonly abused substances among adolescents, use of oxycodone and over-the counter cough/cold medications (containing dextromethorphan) is rising (Sanchez-Samper & Knight, 2009).

Young adults comprise a significant portion of PPR misusers and treatment enrollees, while the 50+ population rarely misuses PPRs. Notably, older adults over age 55 are frequent patients of legitimate PPR therapy.

**Race.** The majority of PPR misusers are White, though racial disparities appear when evaluating the treatment-seeking population. Hispanic and Black patients are proportionately more likely to be uninsured, hindering the procurement of health services, especially specialty care such as addiction treatment (National Center for Health Statistics, 2016). Historically, racial minorities were significantly less likely to access general health care, though the Affordable Care Act (ACA) appears to have improved such disparities (Weissman, Russell, Jay, & Malaspina, 2018).

**Income.** Low-income individuals (less than $19,000 per year) are most likely to be enrolled in addiction treatment. These individuals are often insured through Medicaid, the largest single payer for mental health services (Rowan et al., 2013). Wealthier individuals are underrepresented among treatment enrollees, suggesting that a higher salary does not necessarily confer a better ability to pay for treatment.

**Comparison between PPR Misuse and Treatment Enrollment**

Table 4 shows that PPR misusers and treatment enrollees share similar characteristics. In both groups, the following characteristics are overrepresented: homosexual, male, divorced, and White. Some variation between the populations is seen in education, age, and income. However, since the values of the variant characteristics are contiguous (e.g., ages 18 to 25 and 26 to 34), these differences may not be demographically significant.

Instead of considering these discrepancies representative of variance between the populations of PPR misusers and treatment enrollees, the most frequent values of education, age

and income can be combined into a single demographic profile: White, homosexual, divorced males between the ages of 12 and 34 who have earned a high school diploma or GED and make under $19,000/year. These characteristics represent the highest-risk population for PPR misuse and a significant portion of treatment enrollees. This analysis reveals that demographic groups at higher risk for PPR misuse are, in general, taking advantage of addiction treatment at rates proportional to use.

**Barriers to Treatment**

Consistent with existing literature, personal (attitudinal, internal) factors are most commonly cited as reasons for not seeking addiction treatment despite recent substance abuse. This suggests that a large portion of people with mental health diagnoses and potential comorbid substance use remain in the precontemplation stage of change with regard to their mental health (Prochaska, 2013).

Based on Table 5, the following observations are noted:

- Homosexual individuals are more likely to cite program availability factors. Treatment facilities often lack services tailored to the LGB experience, which may deter homosexual patients.
- Males and females cite financial, personal, program, and transport factors at similar rates.
- Divorcees report financial barriers more frequently than their single, married, or widowed counterparts, while widows are more likely to report personal factors. Financial instability is common after divorce, especially among women, which may explain this finding (Amato, 2010; Callens & Croux, 2009; Heath & Kiker, 1992).

- Despite the enhanced earning potential associated with a higher level of education, the proportion of college-educated individuals reporting financial barriers to treatment is similar to that of high school graduates and GED recipients.
- Adolescents and young adults (ages 12 to 25) are less likely than their older counterparts to cite financial barriers, perhaps because they are relying on parental contributions (through insurance or independent wealth) to pay for treatment.
- The distribution of reason categories among the 65+ age group is not significant because of the *n* of four.
- Racial minorities (Hispanics and Blacks) are more likely to report financial difficulties than Whites. In Blacks, financial distress may be linked to the higher proportion noting transportation concerns.
- High income is, not surprisingly, associated with fewer financial concerns when approaching treatment for addiction. There does not appear to be a discernable pattern in reason categories across income ranges.

In general, financial barriers appear to be the most cited factor for not seeking treatment, though personal reasons are still most frequent across the board. Further analysis of the subtypes of personal reasons by demographic characteristics yields the following observations:

- Homosexual individuals are less likely than their heterosexual counterparts to believe that treatment will not help their condition and to feel that treatment would interfere with other responsibilities.

- Women report social concerns (stigmatization or fear that others will learn of their addictions) at a higher rate than men. Men, on the other hand, are less likely to report readiness or a need for treatment.
- Married individuals cite opinions of use as reasons for non-treatment seeking more often than single, divorced, or widowed respondents.
- College graduates are more likely to report low need or readiness for treatment, while those with only a high school diploma or GED report employment concerns or lack of time more frequently.
- No discernable pattern of personal reasons for non-treatment seeking is seen across age or income ranges.
- White and Black PPR misusers report each subtype of personal reason at similar rates. Hispanics, however, are more likely to cite other responsibilities as a barrier to treatment.

**Implications for Public Health**

Though barriers to addiction treatment are often internal to the individual, public health agencies play a critical role in health education and prevention. The findings of this study inform public health efforts by providing a demographic picture of the high-risk population, allowing for a targeted community-level intervention addressing personal, financial, and transport concerns (Figure 7). Program availability factors may be addressed by treatment facilities.

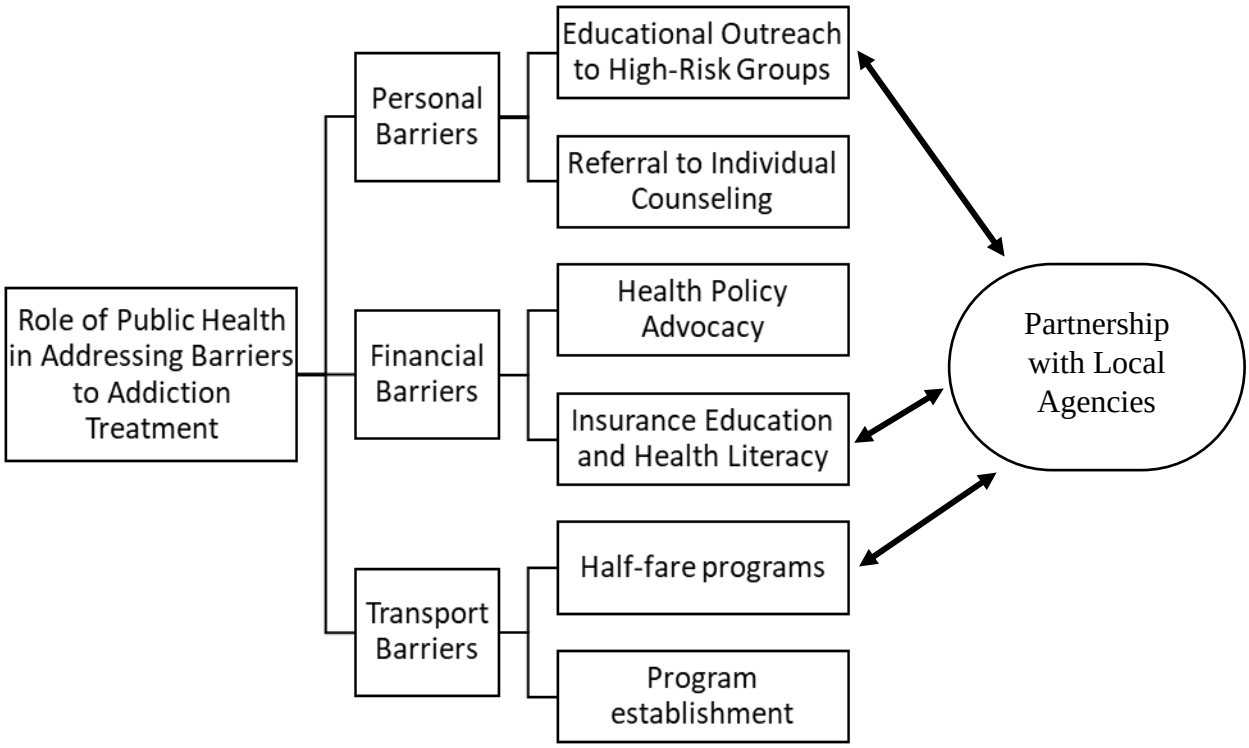


*Figure 7.* Role of public health in addressing personal, financial, and transport barriers to addiction treatment.

As noted below, personal barriers to treatment are often most appropriately addressed at an individual level. However, education on emotional coping skills and alternatives to substance use contributes to prevention efforts. Such education can be tailored to high-risk groups and presented in partnership with local groups (including community-based organizations and Alcohol, Drug Addiction, and Mental Health Services). For example, public health professionals may speak on coping skills to a divorce recovery support group, strengthening the ability of the clients to cope with their loss in a healthy manner and offering resources for those who may already be using. In addition, due to the wide reach of public health, agencies can serve as an informational hub for those struggling with addiction or at risk for substance use/abuse. One aspect of this effort may be the provision of referrals to one-on-one counseling, so that

underlying individual emotional concerns may be addressed early in the trajectory of use. The Community Overdose Action Team (COAT) in Dayton, Ohio, serves as a landmark example of an agency integrating local resources to educate the public on the subject of addiction and minimize personal barriers to treatment. The education and information branch of COAT reaches out to patients after overdose to offer information about services, and partners with such agencies as the Montgomery County Drug-Free Coalition to expand outreach services (COAT, 2017).

A significant portion of PPR misusers report financial barriers to seeking addiction treatment. Expanded treatment access to the uninsured or underinsured populations is largely a policy concern, addressed by such legislature as the ACA. Public health professionals carry a unique perspective on the impact of health policy on the wellness of communities and can advocate for expanded health insurance systems that include mental health and addiction services. In addition, public health agencies may engage in educational efforts to promote health literacy and understanding of existing insurance coverage and benefits. This will help inform patients of available treatment options and minimize financial barriers.

Transportation is a difficult barrier to address, especially in rural areas with limited public transit. In urban settings, partnerships between public health agencies and public transit authorities may contribute to the development of, for example, half-fare public transit programs for health-related transportation. For rural areas with no specialized treatment facilities, outpatient addiction services may be integrated into local primary care establishments to reduce the travel needed to access treatment.

PPR misuse is highly prevalent in the United States, but heroin, fentanyl, and potent fentanyl analogs are responsible for the majority of opioid-related overdose deaths. The vast majority (79.5%) of recent heroin users report previous PPR misuse, illustrating PPR misuse as a

significant risk factor for the initiation of intravenous opioid abuse (Muhuri, Gfroerer, & Davies, 2013). Thus, understanding the demographic characteristics of PPR misusers allows public health agencies to address both PPR and illicit opioid use in a targeted manner.

**Implications for Clinical Practice**

Public health and health policy efforts toward addiction treatment are more often focused toward removing structural barriers such as finance or transportation. These crucial efforts target only a subset of barriers faced by potential patients of addiction treatment. Since the majority of recent PPR misusers who are not in addiction treatment cite personal opinions of the severity of their own use or their need/desire for treatment, individual counseling by clinicians may be an effective approach to the opioid crisis and addiction in general.

Prochaska's (2013) Transtheoretical Model of Behavioral Change provides a framework for the evaluation and counseling of PPR-misusing patients. This analysis demonstrates that a large portion of PPR misusers are in the precontemplation stage of change, unaware of the problematic nature of their use or its potential dangers (Prochaska, 2013). These users may be unwilling to address their behaviors and thoughts surrounding PPR use, may feel demoralized by previous relapses, or may simply fear the uncertainty of treatment, as suggested by the literature reviewed above.

The role of the clinician, e.g. a PCP or counselor, is to aid the patient in his or her transition from the pre-contemplative to the contemplative stage of change, as appropriate (Prochaska, 2013). This process begins with the establishment of a trusting, long-term relationship in which the patient feels comfortable sharing details of his or her health behaviors. The findings of this study reveal demographic trends in PPR misuse that are associated with past trauma or ACEs, illustrating a population in both physical and emotional pain. Provider

understanding of lifetime stress and trauma as a social determinant of behavioral health eases the provision of compassionate, informed, and effective care. By fostering a nonjudgmental environment and regularly screening for behavioral or emotional risk factors for substance abuse, the attentive clinician lays the foundation for timely and productive conversation about risky behaviors, should the situation arise. The patient-provider relationship is one valuable component of the complex support system needed for establishment of maintenance of long-term recovery from adduction.

The demographic findings of this study allow the clinician to identify individuals in his or her practice at high risk for substance use. For example, recent divorcees or members of the LGB community reporting emotional difficulties or a history of substance abuse may be targeted for further screening and counseling.

For clinicians who wish to combat addiction on a community level, advocacy of integration of general medical care and behavioral health services is encouraged wherever possible. Integrated services may expand access, maximize convenience, and increase patient compliance by making healthcare a ‘one-stop-shop’. The Protecting Access to Medicare Act provides guidelines for the establishment of Certified Community Behavioral Health Clinics, which serve as a model for the integration of physical and behavioral health services (SAMHSA, 2016b).

**Strengths**

An abundance of research exists describing demographic variables in relation to substance abuse, but this study contributes to the body of knowledge regarding PPR misuse specifically. As agencies nationwide continue to combat the opioid epidemic, specific information regarding the PPR-misusing population is valuable.

**Limitations**

Existing literature studies the interplay of demographic characteristics and their effects on substance use, e.g., gender and educational level. This analysis does not include cross-examination of the interaction between demographic characteristics, making it difficult to parse out the effects of a single demographic variable on PPR misuse.

Additionally, data regarding the degree of treatment engagement is absent from this study. Though an individual may report current enrollment in addiction treatment, there may be significant variability in the type of treatment, the number of appointments kept, medication compliance, and other indicators of treatment engagement. Thus, enrollment in treatment may not necessarily represent the attainment of favorable recovery outcomes.

**Areas for Future Research**

NSDUH data is limited on the misuse of PPRs and illicit drugs in individuals older than age 65. The older population comprises a large portion of chronic pain patients, raising questions about PPR use and misuse among elders. The association of age and income with treatment-seeking deserves further study to maximize recovery outcomes for the full spectrum of age and socioeconomic status.

Demographic profiles of the PPR-misusing population provide a snapshot of the opioid epidemic but must be considered in the dynamic context of families. Future research may explore the later implications for children growing up with parents living with drug addiction. ACE research addresses traumatic events, but the results of cumulative daily stress/influence of a family member’s addiction warrants further investigation. In combination with continued research on the effects of social support (especially from family members), these efforts would contribute to the body of knowledge surrounding generational cycles of addiction.

Social stigmatization poses a barrier to many PPR misusers considering treatment, suggesting that continued efforts toward widespread acceptance of addiction as a disease, rather than a moral failing, are warranted. Research regarding the efficacy of destigmatization strategies among both health professionals and community members would be valuable in developing evidence-based interventions. Conversion of the societal attitude toward addiction from prejudice to support will foster a favorable environment for recovery at the community level.

## Conclusion

The opioid crisis in the United States has brought to light the indiscriminate and unforgiving nature of addiction. This demographic analysis of PPR misusers and treatment enrollee identified high-risk characteristics, which represent groups to be targeted by individual clinicians and public health professionals alike. Such characteristics include homosexuality, divorce, male gender, age between 18-34, and a high school diploma or GED as the highest level of education. These characteristics reflect groups with unique psychological and socioeconomic stressors, predisposing to substance abuse. Multifaceted partnership between healthcare facilities, public health agencies, and community members is crucial to minimizing barriers to addiction treatment and ensuring care for the PPR-misusing population.

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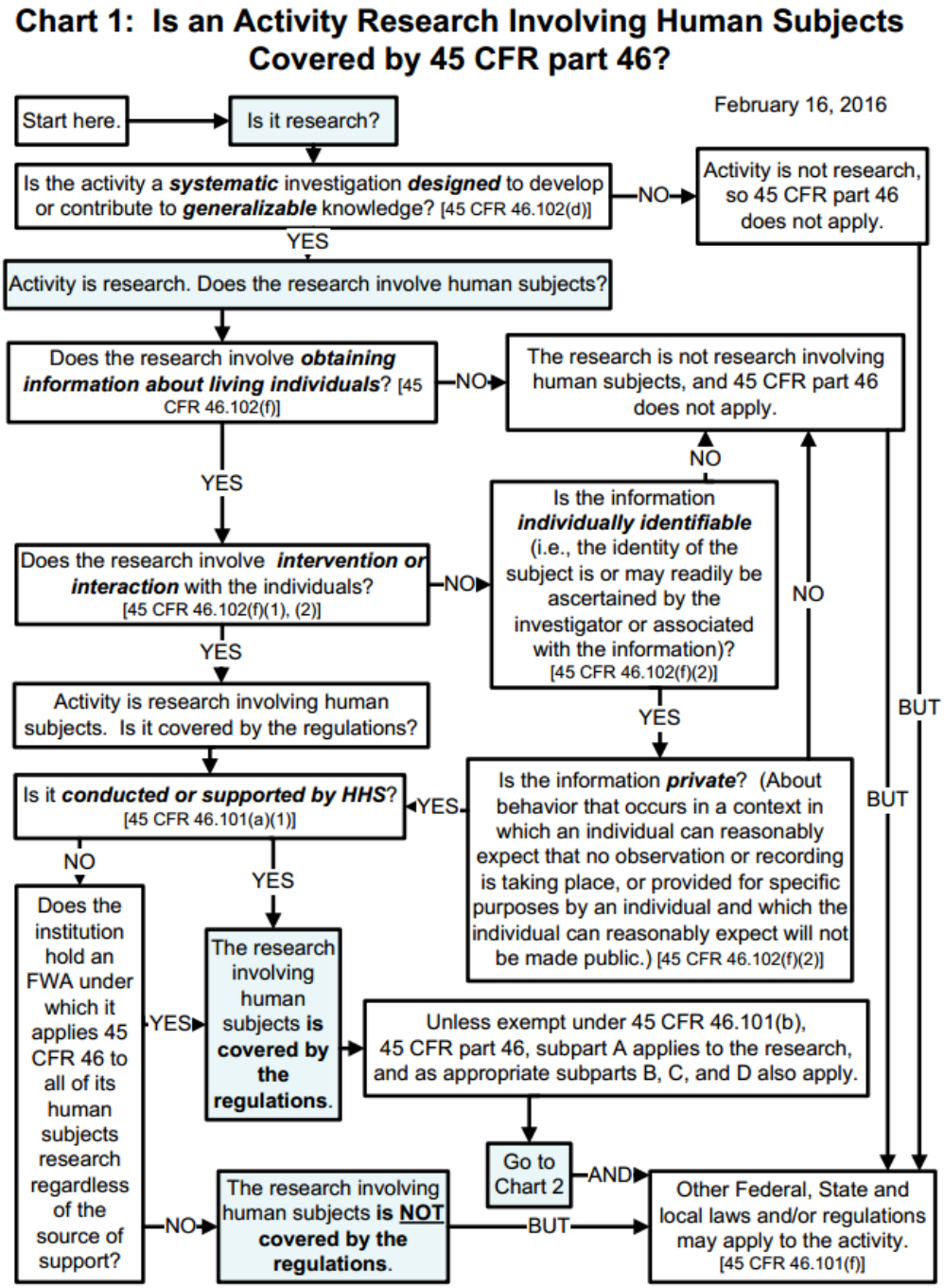
Appendix A - Human Subject Regulations Decision Chart



Appendix B – Information from Table 5, Visualized in a Series of Charts

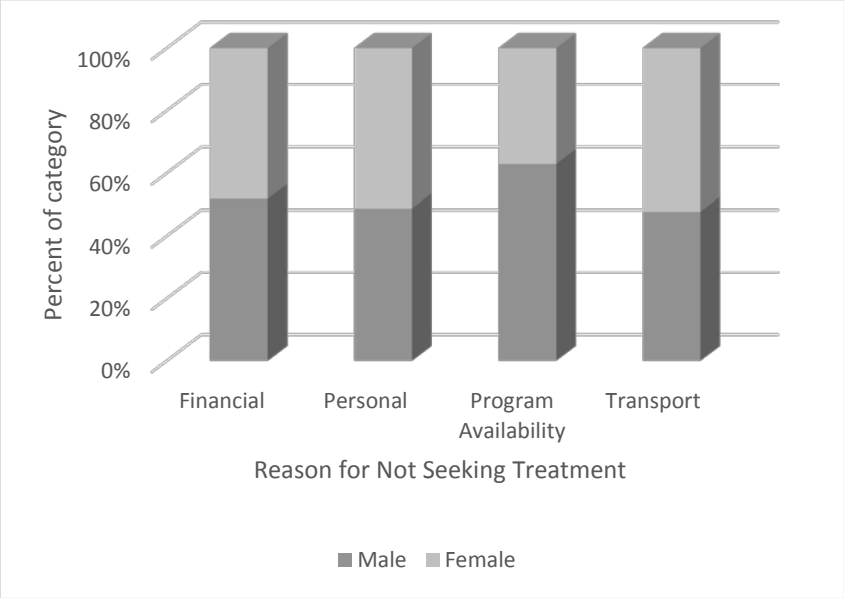



*Figure 1.* Reasons for non-treatment seeking by gender.

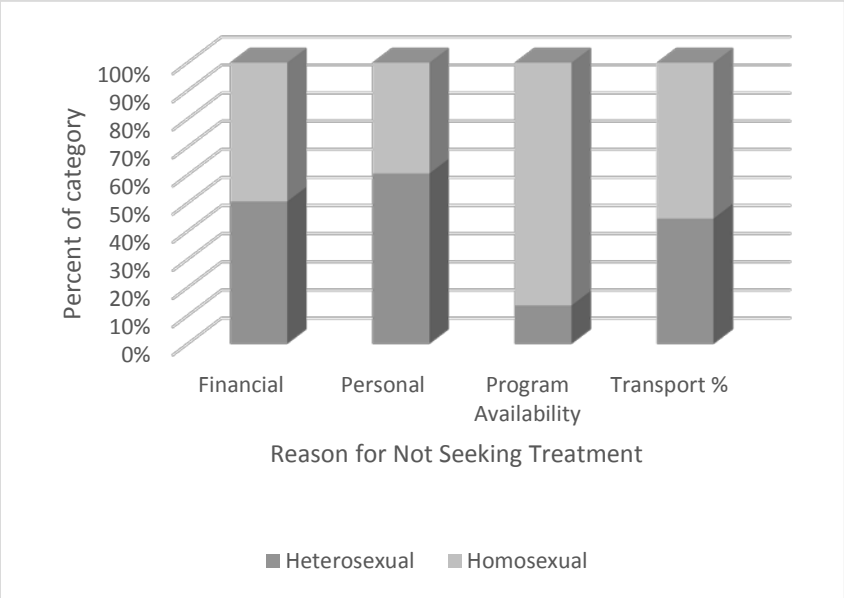



*Figure 2.* Reasons for non-treatment seeking by sexuality.

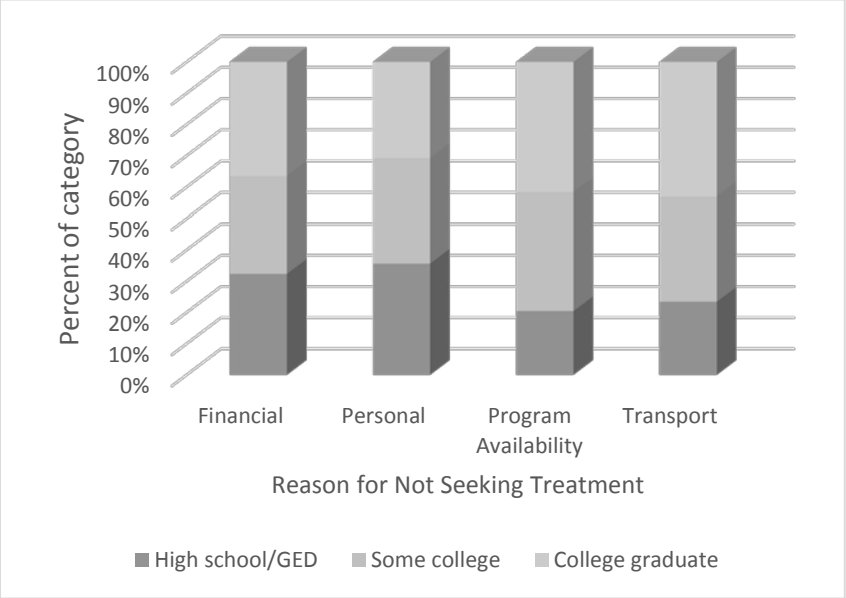



*Figure 3.* Reasons for non-treatment seeking by education level.

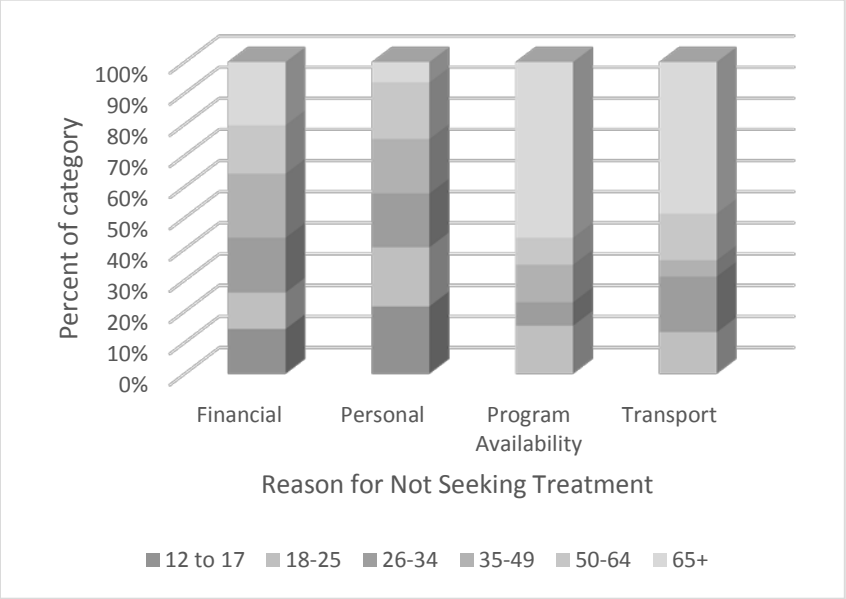



*Figure 4.* Reasons for non-treatment seeking by age group.

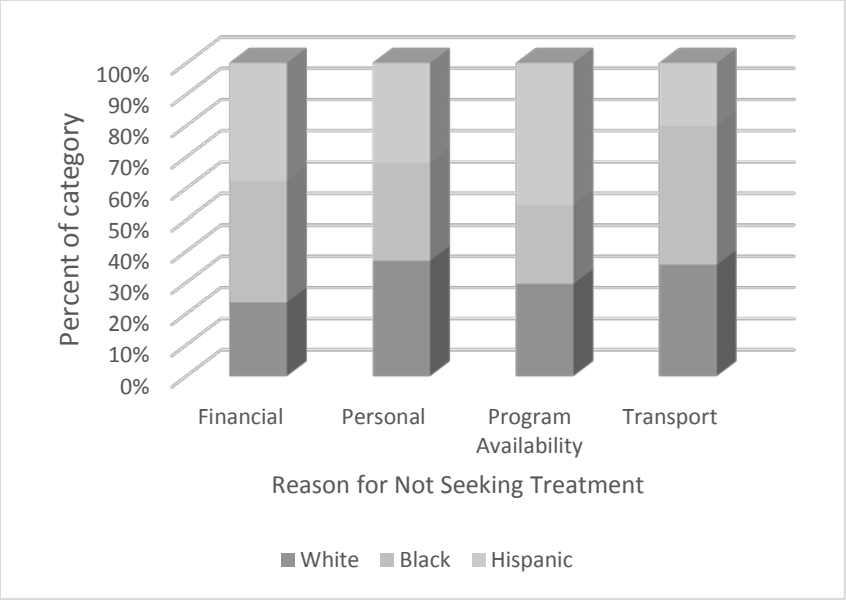



*Figure 5.* Reasons for non-treatment seeking by race.

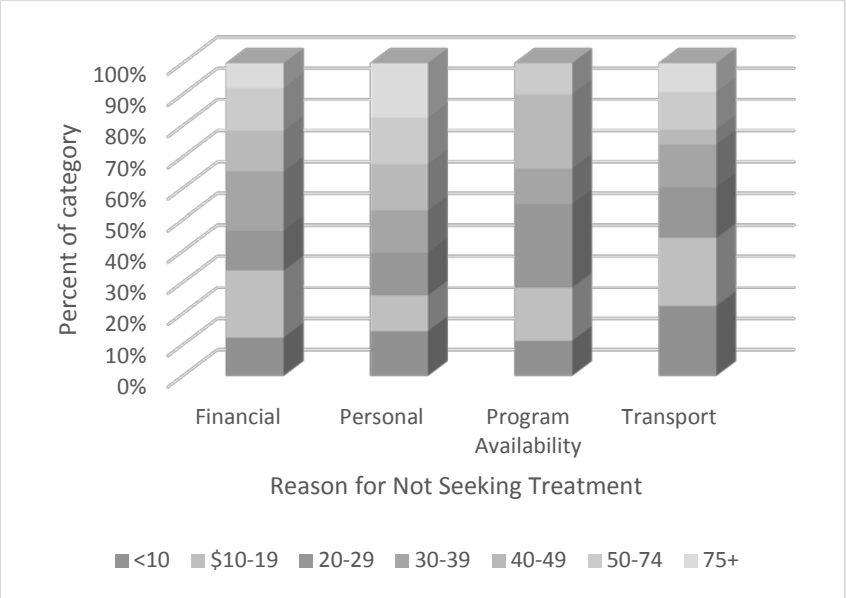



*Figure 6.* Reasons for non-treatment seeking by yearly income range (thousands of dollars per year).

Appendix C – List of Competencies Met in Integrative Learning Experience

## Wright State Program Public Health Competencies Checklist

| |
|---|
| Identify and describe the 10 Essential Public Health Services that serve as the basis for public health performance. |
| Assess and utilize quantitative and qualitative data. |
| Apply analytical reasoning and methods in data analysis to describe the health of a community. |
| Apply behavior theory and disease prevention models to develop community health promotion and intervention programs. |
| Describe how policies, systems, and environment affect the health of populations. |
| Communicate public health information to lay and/or professional audiences with linguistic and cultural sensitivity. |
| Address population diversity when developing policies, programs, and services. |
| Engage with community members and stakeholders using individual, team, and organizational opportunities. |
| Make evidence-informed decisions in public health practice. |
| Evaluate and interpret evidence, including strengths, limitations, and practical implications. |
| Demonstrate ethical standards in research, data collection and management, data analysis, and communication. |
| Explain public health as part of a larger inter-related system of organizations that influence the health of populations at local, national, and global levels. |

## Concentration Specific Competencies Checklist

| Population Health Concentration |
|---|
| Explain a population health approach to improving health status |
| Use evidence-based problem solving in the context of a particular population health challenge. |
| Demonstrate application of an advanced qualitative or quantitative research methodology. |
| Demonstrate the ability to contextualize and integrate knowledge of a specific population health issue. |
| Evaluate population health programs or policies that are designed to improve the health of the population, reduce disparities, or increase equity. |