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Sources of Pharmaceutical Opioids for Non-Medical Use Among Young Adults

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Abstract

The study uses qualitative and quantitative data to describe sources of pain pills for illicit use among young adult (18–23 year-old) users. Respondent driven sampling was used to recruit 390 individuals in the Columbus, Ohio area. The sample was almost 50% white and about 55% male. Qualitative interview participants (n=45) were selected from the larger sample. Qualitative data suggest that pharmaceutical opioid availability was so pervasive that most individuals did not have to venture outside of their immediate social networks to find people who sold or shared pills. Participants emphasized differences between those who are *actively* involved in obtaining pills, and those who play a more *passive* role. *Active* involvement was described as going out searching for pills and paying money to obtain them. In contrast, *passive* role included obtaining pills when somebody offered or shared them free of charge. Multiple logistic regression analysis indicates that a more active role in obtaining pharmaceutical opioids was related to being white, more frequent use of pharmaceutical opioids, extended-release oxycodone use, and using pharmaceutical opioids to get high, as opposed to self-treating a health problem. The study results can help inform drug use epidemiology, interventions and policy.

Keywords

pharmaceutical opioid abuse; sources of diversion; young adults; qualitative methods; mixed methods

INTRODUCTION

Therapeutic use of pharmaceutical opioids has increased substantially in the United States (Manchikanti et al. 2010; Compton and Volkow 2006; Zacny et al. 2003). Retail distribution and consumption of oxycodone increased from 1,667 grams per 100,000 persons in 1997 to

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13,333 in 2006. During the same time period, consumption of hydrocodone increased from 3,249 to 10,749 grams and methadone from 194 to 2,348 grams per 100,000 people (DEA, 2007). Although the United States has about 5% of the world's population, it is responsible for over 80% of the global consumption of pharmaceutical opioids (PO) (International Narcotics Control Board 2010a, 2010b).

The increase in the legitimate use of opioids in the U.S. has been accompanied by a substantial rise in non-medical use of these drugs (Compton & Volkow 2006; Zacny et al. 2003), with lifetime rates as high as 24.3% among young adults (18 to 25 years old), according to the National Survey on Drug Use and Health (NSDUH) (SAMHSA 2010). These increases have resulted in escalating rates of unintentional overdose deaths (Paulozzi, Budnitz, & Xi 2006; Paulozzi & Anest 2007; Paulozzi & Xi 2008), a rising prevalence of prescription opioid abuse and dependence disorders (McCabe, Cranford & West 2008; SAMHSA July 15, 2010) and expanded pathways to heroin addiction (Siegal et al. 2003; Lankenau et al. 2011; Peavy et al. 2012; Canfield et al. 2010; Muhuri, Gfroerer, & Davies 2013; Jones 2013).

Several studies have examined sources of diverted pharmaceutical opioids among treatment-based and street-based illicit drug users (Inciardi et al. 2007; Inciardi et al. 2009; Davis & Johnson 2008; Fischer et al. 2009; Rosenblum et al. 2007). These studies have shown that methadone-maintenance patients, street-based drug users and club drug users rely on very diverse sources for their illicit pharmaceutical opioids, including dealers, friends/relatives and medical sources (Inciardi et al. 2009; Davis & Johnson 2008; Fischer et al. 2009; Rosenblum et al. 2007). Further, some research has pointed out that reliance on different sources of illicit opioids may indicate distinct patterns and motives of use. For example, a study conducted with street-based drug users in New York City found that the sources of diverted pharmaceutical opioids varied depending on the motivations of use-- when used to get high, OxyContin was obtained from a dealer by 62% of the sample, but about 38% of the sample obtained OxyContin from a doctor or pharmacy. In contrast 33% of those using OxyContin for the self-treatment of pain had obtained it from a dealer, while 83% obtained from medical sources (Davis & Johnson 2008). A study based on the NSDUH data found that individuals who obtained pharmaceutical opioids and other prescription drugs from friends or relatives for free reported less frequent use and also were less likely to report abuse and dependence (Ford & Lacerenza 2011). To develop adequate prevention and policy measures, more research is needed to identify patterns of diversion that are distinct to local profiles and/or sub-populations of users (Fischer et al. 2009).

Although young adults constitute the largest proportion of illicit opioid users, few studies have examined characteristics of pharmaceutical opioid diversion in this population. A Web-based study with undergraduate students (McCabe et al. 2007; McCabe & Boyd 2005) described sources of diverted pharmaceutical opioids and other prescription drugs among young adults. Friends and parents were the leading sources of prescription opioids among college students, and obtaining these drugs from peers was linked to a greater risk of alcohol and other drug-related problems (McCabe et al. 2007). Although this study provides important information about the illicit use of prescription drugs among college students, additional research is needed to provide a more comprehensive profile of sources of diverted

pharmaceutical opioids among young adults, including those who do not attend or have dropped out of college. A better understanding of these practices is important to address diversion and to develop appropriate intervention approaches among young adult users.

The present study uses *baseline* data from our natural history project designed to identify characteristics associated with transition to opioid dependence among a community-recruited sample of young adult non-medical users of pharmaceutical opioids. Using qualitative and quantitative data that were collected at baseline interviews, the study aims to: 1) describe the sources of diverted pharmaceutical opioids among young adults; 2) understand the processes, circumstances and reasons of using different types of sources to obtain pharmaceutical opioids; and 3) analyze the relationship between the sources and patterns of illicit pharmaceutical opioid use.

METHODS

Mixed methods research integrates quantitative and qualitative approaches to maximize the strength and minimize the weakness of each type of data and to provide a comprehensive, multi-level understanding of research questions (Creswell et al. 2011; Tashakkori & Teddlie 2003). In the current study, qualitative and quantitative data were collected independently from each other, as parallel data streams. Qualitative and quantitative data were merged at the data analysis and interpretation stage to describe sources and processes of pain pill acquisition, and to examine a relationship between the sources and patterns of pain pill use.

QUANTITATIVE DATA COLLECTION AND ANALYSIS

Between April 2009 and May 2010, 390 young adults were recruited to participate in the natural history project on trajectories of pharmaceutical opioid use. This paper uses *baseline* data collected for our longitudinal project that focused on trajectories of illicit opioid use among young adults (Carlson et al. 2014; Daniulaityte et al. 2012). A respondent-driven sampling plan was used to recruit participants (Heckathorn 1997; Heckathorn 2002; Wang et al. 2005). To generate a sample of 390 individuals, initial recruits (“seeds”) and subsequent participants were asked to refer up to 3 individuals and were compensated \$15 for each eligible recruit. More information on the sampling methodology is available elsewhere (Daniulaityte et al. 2012). The main purpose of the longitudinal study was to identify characteristics associated with transition to opioid dependence among a community-recruited sample of young adults who were non-dependent illicit pharmaceutical opioid users at baseline. Illicit or non-medical use was defined as using pharmaceutical opioids that are not legally permitted or authorized by a prescribing physician. Eligibility criteria were designed to capture emerging adults (age 18–23) who display high rates of illicit drug use, but also undergo life transitions that influence their drug use trajectories.

To be eligible for the study, participants had to: 1) be 18–23 years old; 2) reside in the Columbus, Ohio, area; 3) self-report non-medical use of pharmaceutical opioids on at least 5 occasions in the past 90 days; 4) show no lifetime dependence on opioids based on DSM-IV criteria; 5) have no history of heroin use or drug injection; 6) not be engaged in a formal drug abuse treatment program in the last 30 days; 7) express an intention to use non-prescribed pharmaceutical opioids again; and 8) not currently be awaiting trial or have

pending criminal charges. DSM-IV criteria were assessed by a trained interviewer using the DSM-IV Checklist (Forman et al. 2004; Hudziak et al. 1993). Participants who met a criterion for abuse and/or 1–2 criteria for dependence were eligible. Participants who met 3 criteria for dependence within any 12-month period were ineligible, but those who met 3 or more dependence criteria that were not clustered in a 12-month period were eligible. Informed consent was obtained from all participants following a protocol that was approved by Wright State University's Institutional Review Board (IRB).

Interviews were conducted in private project offices. Baseline structured interviews ranged from 1.5 to 2.5 hours and included standardized instrumentation, such as the DSM-IV Checklist and CDIS, as well as author-generated items on drug use practices and other issues. The questionnaire was largely interviewer-administered in a face-to-face session, but also contained short segments administered via audio computer-assisted self-interview methods focusing on HIV risk behaviors. Participants were compensated \$50 for the baseline assessment and \$10 for transportation.

Statistical analysis was conducted using SPSS. Multiple logistic regression analysis was used to examine the relationship between the sources of illicit pain pills and selected demographic and drug use characteristics. Based on qualitative findings and prior empirical research on diversion and sources of prescription drug for non-medical use (Davis & Johnson 2008; Ford & Lacerenza 2011; McCabe et al. 2007; McCabe & Boyd 2005; Boyd et al. 2007), the following variables were selected for inclusion in the logistic regression analysis: gender, ethnicity, frequency of pain pill use in the past 6 months (because of skewed distribution, frequency of use was converted into a categorical variable), method of administration, reason of non-medical use of pain pills, and illicit use of OxyContin in the past six months.

QUALITATIVE DATA COLLECTION AND ANALYSIS

Qualitative baseline interviews were conducted with 45 individuals, who were selected from the larger, quantitative sample (N=390). Upon completing structured interviews with all 390 participants in the quantitative study, project interviewers summarized the interviews highlighting socio-demographic characteristics, major life events and drug use practices of each subject. These summaries then were used to select potential qualitative interview participants who represent a wide range of drug use experiences and socio-demographic backgrounds.

The qualitative interviews used a life-history format and consisted of open-ended questions designed to gain an insider's perspective on a range of salient issues, including drug use history and non-medical use of pharmaceutical opioids. The interview protocol was informed by previous ethnographic research (Carlson & Siegal 1991; Daniulaityte, Carlson & Kenne 2006; Daniulaityte, Carlson & Siegal 2007), and was pilot-tested with key informants.

All interviews were audio-recorded after obtaining an informed consent approved by Wright State University's IRB. They were transcribed verbatim and then analyzed. The qualitative data analysis involved three overlapping stages: 1) development of a coding scheme by

reading and re-reading the text; 2) consistent application of codes to the entire body of the text; and 3) an interpretation and analysis phase in which codes were examined and linked to one another to deepen understanding of context-specific meanings and processes related to the sources of pharmaceutical opioids for illicit use (Miles & Huberman 1994; LeCompte & Schensul 1999; Strauss & Corbin 1990). NVivo software (QSR International 2002) was used to assist with qualitative data coding and analysis. All names used in this paper are pseudonyms.

RESULTS

PARTICIPANT CHARACTERISTICS

The quantitative sample (N=390) was almost 49% white and about 55% male. Almost 50% reported illicit pain pill use on 1–2 days per week (Table 1). Participants reported illicit use of various pharmaceutical opioids in the past 6 months—about 92% reported illicit use of oxycodone (e.g., Percocet, Roxicet and other immediate release oxycodone), 84% hydrocodone (e.g., Vicodin), 29.5% OxyContin (oxycodone, extended release), about 25% codeine, 7.6% morphine, 7.1% methadone, and 6.6% hydromorphone. Many reported use of other drugs in the past 6 months—about 77% used marijuana, 32% illicit benzodiazepines, 15% illicit prescription stimulants, 21% MDMA, 16% psilocybin and/or LSD, and almost 14% cocaine.

Among the qualitative sub-sample (n=45), over 50% were male and about 65% were white. Oxycodone and hydrocodone were the most frequently used pharmaceutical opioids. Their reported frequency of use ranged from once a month to nearly daily use.

SOURCES OF PHARMACEUTICAL OPIOIDS

Quantitative baseline interviews collected information about: 1) the type of sources that were ever used to obtain pharmaceutical opioids for illicit use; and 2) the most common source used in the past 6 months (Table 2). Qualitative data provided additional and more detailed information about the processes, circumstances and reasons of using different types of sources to obtain pharmaceutical opioids (pain pills) for non-medical use.

PARENTAL SOURCES

About 44% of the quantitative sample reported that they got pain pills from relatives at least once in the past, and 11% indicated relatives were the most common source in the past 6 months (Table 2). Several qualitative interview participants described situations when they received pain pills from their parents. In most such cases pain pills were given for a “justifiable” reason, i.e. to self-medicate pain but not for recreational use. “Ethan” (white male, 20) explained how he obtained pain pills from his father:

My dad, when he was sick, he used to get oxycodones... it was a five milligram [tablets]. And he used to get those, and he would give me a couple if I wanted some or whatever. Because I do have like a pain in my back from when I broke my leg, I have a nerve that’s pinched and it comes up my back somewhat. So I mean, he wasn’t just going to give it to me, oh you know, eat two of those and chill or what

not, but I would tell him my back is hurting so he would give me a few 'cause he'd get a ton of em.

Taking or stealing medications from parents or other relatives was less commonly reported. Only 1% indicated it was the most common way to obtain pharmaceutical opioids in the past 6 months (Table 2). Qualitative interview participants noted that stealing/taking medications from parents was more common in the initial stages of their pharmaceutical opioid use, before they got access to other sources through peers and acquaintances. "Ryan" (white male, 23) explained, "I'd take 'em from my dad... Until I graduated [from high school] and found people on the street who were selling them."

MEDICAL SOURCES

Although 47% reported lifetime use of their own prescriptions for non-medical purposes, only about 4% reported that their own prescription was the primary source of pharmaceutical opioids in the past 6 months (Table 3). Qualitative interview participants reported using left-over medications from their own prescriptions and indicated that prescriptions for pharmaceutical opioids were rather easy to get and too generous at times. "Marco" (Hispanic male, 18) described his experience:

M: I had a messed up tooth and he gave me Vicodins...I got 20 of em.

RD: Did you have a lot of pain?

M: Did I have pain? Yeah but after like one day it went away. And I took em all.

Drug seeking/doctor shopping was reported by very few individuals--only 0.5% of the larger sample indicated that receiving prescriptions from one or multiple physicians without a legitimate medical reason was the most common way to obtain pain pills in the past 6 months (Table 3). Qualitative interviews suggest that since the study participants were very young and fairly healthy, the majority felt it was difficult for them to make a believable case about ill health. For example, "Alexandra" (white female, 20) explained: "I've thought about it... I have no reason for a doctor to give me a prescription, no, that's waste of my time to go in there and try and get him to [prescribe]... I'm not a good liar..." "Shirley" (white female, 19) shared her experience:

There was one time where we had no money, we had no pills, no weed, no nothing. So I went to the hospital, he [boyfriend] went to the hospital, we went together, but... we acted like we didn't know each other. He tried to get pain pills, I tried to get pain pills to sell them to get money and to take 'em to get high, but neither of us walked out with any of 'em... We walked out with... it was like, Tramadol or something like that, like Darvocets or something like that. Not no pain pills that I could sell...

Further, since many participants lacked health insurance, obtaining pain pills from medical sources, even for legitimate medical problems, was very costly and more difficult than getting them from illegal sources. "Matt" (white male, 20) shared his experiences: "Went to urgent care and lied and said I fell and hurt my foot just so I could get more [pain pills]. And they'll give you like a prescription of ten of em... In the long run you end up owing a lot more money... You owe for the x-rays and everything..."

GETTING PAIN PILLS FOR FREE

About 88% of the 390 participants reported they have ever received free pain pills from their friends or acquaintances, and about 29% reported receiving free pain pills from other people was the most common source in the past 6 months (Table 3). Similarly, many qualitative interview participants indicated that getting pain pills for free was extremely common. Free pain pills were typically available from someone who had a prescription or other type of easy access to “plentiful” pain pills. For example, “Marco” (Hispanic male, 18) described how he obtained hydrocodone tablets: “One of my friends at work gave me, he got them prescribed, and he asked me if I wanted some. And he gave me like 5 of them.” “Alexandra” (white female, 20) also explained how she obtained pain pills from one of her good friends: “Oh, he gives ‘em to me for free, it’s his prescription. He doesn’t know what to do with ‘em and he can’t get ‘em off his hands. And I just, I ask him for ‘em, he’s got like month old prescriptions, like he’s got a bunch.”

Further, a person was also more likely to receive free pain pills when he/she had a “justifiable” reason—such as pain or injury, as opposed to using for recreation. For example, “Sandra” (white female, 20) who typically used pain pills to self-medicate backaches, explained how she obtained free pills from one of her friends: “He’ll give ‘em to me, like ‘Here,’ you know, ‘I’ve got some extra.’ And he’ll give me like ten of them at a time. I mean, he’s nice, like he’s my good guy friend, and he knows what I’m using them for...” Similarly, “Karysha” (African American female, 23) explained:

My one friend gave me a bottle of Percocets and I was taking them. But I wasn’t just taking them like, oh I want to get high, I want to take the Percocet.... but if I have a headache or... my back is hurting then I got these Percocets... People can sell Percocets you know, but she... she was getting ‘em on a basis like she, they were prescribed to her, but she would give ‘em to me, and I think at that time I was having real bad headaches so I think that’s why she gave me the pills....

BUYING PAIN PILLS

Buying pain pills was the most common method of acquisition in the past 6 months and was reported by about 54% of the sample (Table 3). Qualitative interviews suggest that for the majority of participants buying did not involve dealing with strangers in anonymous street-based transactions. Pain pill availability was so pervasive that many did not have to venture outside of their immediate social networks to find people who sold pain pills. “Ethan” (white male, 20) explained, “Somebody that I know that I just bump into like through my everyday basis has pills. And it’s like either asks me if I know anyone who wants to buy some or if I want to buy some.”

Participants reported buying pain pills from a broad range of sources, such as regular dealers who may travel to other states to obtain pills, more sporadic sellers who attempt to get rid of their prescriptions to make a “quick buck,” and other users who occasionally play a role of a middle man in order to make some extra money and/or cover the cost of their own use. Regardless of their role in pain pill diversion, in many cases these individuals were also friends, co-workers, cousins, or other relatives. For example, “Alan” (white male, 22) explained, “Well there are dealers! Oh, there are dealers! But I’m not like driving up to a

bad neighborhood talking to somebody I don't know, I've known these people for years..." "Sam" (African American male, 21) also commented: "I guess technically [they are dealers], but I would classify them as a friend first.... But like yeah, I call a friend pretty much, most of my friends do drugs. So if they don't have it they'll be like oh 'X has that, call him.'" "Jerry" (white male, 22) described his source: "It's one of my mom's old friends, I always called her 'aunt,' I've known her forever... She had back surgery and she would only take them when she needed 'em so she wouldn't get addicted. She didn't take them every day ... that's when she started selling them...."

Interacting with friends as opposed to "strangers" was advantageous for the purpose of trust and safety. Further, some emphasized that dealing with people from their immediate social networks allowed them to maintain privacy and avoid being labeled as drug users. "Jada" (African American female, 22) explained: "But I did learn of more people who do sell 'em, but it's only certain people that I deal with, 'cause main reason, I don't want everybody knowing my business. Second reason, you just can't trust a lot of people. So I just deal with who I deal with--my friends, and that's just that." "Angie" (white female, 22) also explained that dealing with "friends" as opposed to "strangers" allowed her to control her pain pill use since friends were more respectful of her situation while "strangers" were interested in sales and often disregarded her commitments to reduce or quit pain pill use:

I don't associate with a lot of the people that I used to get them off of 'cause I mean when I got off of them I had people calling me like, "Oh I got your pills, I got what you want." And I'm like, "I don't want them anymore." And they would constantly call me like after I told them I don't do them anymore. And you know, the people that I do buy them off of now, I've known for a while. So they know like... I don't want them [pills] every day, they know, they don't hassle me, and its people I talk to on an everyday basis. They were my friends before pills even came into the situation so....

Most of the commonly used pain pills were viewed as a valuable commodity. They were easy to sell and sometimes even used to exchange goods and services. For example, "Acacia" (African American female, 24) explained: "He [her neighbor] fixed my sink for me. My garbage disposal wouldn't let my food go out. So he came, he was like, 'Oh, you need new pipes.' He was like, 'Give me ten Percocets and twenty dollars, and I'll get you all new pipes,' and he did." "Ethan" (white male, 20) also commented:

I mean it's a good way to make money. I mean people, you know, have health insurance, they get a prescription of generic Vicodin for four dollars from Giant Eagle, and they get thirty of them and they sell them for 2 bucks a pill, you know that's 60 bucks, that's profit 56 dollars right there.

RELATIONSHIP BETWEEN SOURCES AND CHARACTERISTICS OF USE

Many qualitative interview participants emphasized distinction between two ways of obtaining pain pills for illicit use: 1) getting pills for free, which was described as a rather *passive* role in pain pill acquisition; and 2) buying them or obtaining them in a way that required more effort and *active* involvement. The qualitative interview data guided the formulation of two conceptual categories that were used to group quantitative interview

participants into those who played an *active* role in pain pill acquisition and those who were more *passive* in obtaining their pills. The *active* role group included 217 (55.6%) individuals. It was primarily comprised of those who reported “buying” as the most frequent mode to acquire pain pills in the past 6 months. This group also included a few individuals who reported doctor shopping or stealing them from somebody. The *passive* role group included 173 (44.4%) individuals, 158 of them reported getting pain pills for free, while 15 indicated their own prescription as the most frequent way to obtain pain pills for non-medical use in the past 6 months (Table 3). Logistic regression analysis revealed that taking an *active* role in pain pill acquisition as opposed to a passive role was associated with white race, more frequent use of pharmaceutical opioids, non-medical use of OxyContin, and use to get high as opposed to self-medicate a health problem (Table 3).

Qualitative data provide additional contextual information and support for the quantitative findings. According to qualitative interviews, relying on free or gifted pain pills as a primary source for non-medical use signified that the person was a rather casual user, with no real commitment nor heavy involvement in pain pill use. For example, “Julie” (white female, 19) described: “I normally don’t go out searching for them. I’m not like, ‘Oh my god, I really want to find some pain pills today.’ Like it’s normally just like if they’re there, they’re there.” “Noah” (white male, 23) described his use, “Basically, it’s just if somebody has them... I don’t think I’d ever go try and buy them either, just because I do use infrequently and I’d like to keep it that way.” In contrast, active engagement in pain pill acquisition, which entailed searching for pain pills and often paying money for them, signified a more problematic nature of use. For example, “Angie” (white female, 22) explained that when her pain pill use increased, she started spending most of her paycheck on pills and had to put much more effort in findings ways to get them: “One time I got my paycheck and I bought this girl’s whole prescription, and then kind of like flipped them and sold them and made more money, and also had my pills to get high”

DISCUSSION

The study combined qualitative and quantitative findings to describe sources of pharmaceutical opioids for illicit use among young adults. The study has several limitations, including reliance on participants’ self-reports of their non-medical drug use. Although the quality of such data is not without problems, self-reports continue to be the primary source of data for estimating drug use prevalence, and there is evidence that such reports often have good validity and reliability (Adair et al. 1995; Darke 1998). Participants were recruited in one metropolitan area in the Midwestern United States. Because of the strict eligibility criteria that included young, non-dependent users, who have never used heroin nor injected other drugs, results may not reflect views held by older, more advanced drug users, or those who have a greater need for legitimate prescriptions to treat chronic pain. However, young adults as well as those who are non-dependent users represent the larger proportion of the overall population of illicit users of pharmaceutical opioids in the U.S. (SAMHSA, 2010).

Among participants in our study, medical sources, such as having a legitimate prescription or obtaining drugs through doctor shopping, played a less significant role than has been reported in other studies whose samples have consisted largely of older and more advanced

users (Inciardi et al. 2009; Davis & Johnson 2008). In addition, our findings suggest that the Internet did not play an important role in providing access to pharmaceutical opioids for illicit use, which is consistent with other empirical findings (McCabe & Boyd 2005; SAMHSA 2006; Inciardi et al. 2010) but contradictory to some assumptions that had appeared in the scientific and media sources (Wax 2002). This may be related to the fact that our participants were not opioid dependent.

Instead, receiving free pain pills from friends or relatives was common among our participants, with about 40% indicating they were the most common ways to obtain prescription opioids in the past 6 months. NSDUH data also suggest that among young adults, free pain pills from friends or relatives constitute one of the major sources for non-medical use (SAMHSA 2006). Further, more than half of our participants reported that purchasing pain pills was the most common way to obtain them for non-medical use in the past 6 months. Qualitative interviews suggest that most of such transactions occurred in the context of close social relations rather than more formal business-like transactions with street dealers. Some individuals avoided dealing with strangers for the purpose of safety, trust, and privacy. Further, many did not feel the need to find additional sources, since their own immediate social networks were saturated with individuals selling pharmaceutical opioids. Such an informal, socially embedded nature of pharmaceutical opioid sources among young adult users may present greater challenges for diversion control and contribute to lower barriers for access and use.

NSDUH data also suggest that among young adults, buying pain pills from friends or relatives is more common than buying them from a dealer (SAMHSA 2006). In contrast, other studies found that obtaining pain pills from dealers played a key role among street drug users recruited in New York (Davis & Johnson 2008) and Miami (Inciardi et al. 2009) as well as among 5,663 opioid dependent persons enrolled in multi-state survey of 72 methadone maintenance treatment programs (Rosenblum et al. 2007). On the one hand, these variations in findings related to the role of street dealers in pain pill acquisition may point to the evidence regarding a complicated definition of what constitutes a “dealer” and a “friend” who sells pills. On the other hand, more advanced and heavy users of pharmaceutical opioids, and especially those who are dependent on opioids, may need to rely on a broader range of sources, including street drug dealers, in order to assure more reliable and steady access to pain pills for non-medical use (Ford & Lacerenza 2011). Opioid dependent pain pill users differ substantially from our sample of young, non-dependent users.

Our study also indicates that different methods of acquisition were linked to distinct patterns and motivations of use. Qualitative interview participants emphasized profound differences between those who actively “go out searching for pills” and those who are more passive in acquiring pain pills. Logistic regression analysis also revealed that more active role in pain pills acquisition was related to more frequent use of pharmaceutical opioids, non-medical use of OxyContin as well as use to get high as opposed to use for self-medication. Our qualitative findings also suggest that individuals are more likely to receive pain pills for free if they need them for self-medication as opposed to recreational use. As our prior studies have shown, OxyContin is typically viewed as a far more expensive and risky drug than

most other pharmaceutical opioids and its use is more common among those who are more frequent users of pharmaceutical opioids and other drugs (Daniulaityte, Carlson & Kenne 2006; Daniulaityte, Carlson & Kenne 2007; Daniulaityte, Falck & Carlson 2012). Prior studies have also noted more problematic patterns of use among those individuals who bought pain pills as opposed to getting them for free from friends (Ford & Lacerenza 2011) or those who received pain pills from friends as opposed to family members (McCabe et al. 2007).

Overall, young adult, non-dependent users in this sample had easy access to pharmaceutical opioids for non-medical use through informal sources of family, friends and associates. This finding may reflect the fact that the United States is the world's top-ranked country in terms of quantities of pharmaceutical opioids consumed per capita (Fischer et al. 2009; Manchikanti 2007). These findings reinforce prior suggestions about the need of additional patient and health care provider education (Manchikanti 2007) but also suggest the need for a host of reforms to reduce the exceptionally high levels of population-wide consumption of pharmaceutical opioids without compromising standards of medical care (Fischer, Bibby & Bouchard 2010).

Our study has implications for informing interventions designed to impact the pharmaceutical opioid epidemic. Young adult illicit opioid users we recruited represent an important and large population in need of interventions to eliminate, or reduce their pain pill use and *prevent* their transition to opioid dependence, and/or heroin use (Carlson et al. 2014). Our qualitative findings on sources of pain pills indicate that *some* users recognize that assuming an active role in pain pill acquisition suggests a potentially problematic transition in their use while the quantitative findings indicate that people who actively seek pain pills are significantly more likely to be frequent users. This message could be one important component in a standardized intervention approach.

Finally, with recent changes in pain pill prescribing practices in Ohio (Opiate Action Team, Governor of Ohio, October 2013; Ohio Department of Health, September 2012) and nationally (Kerlikowske, September 2013), availability of pain pills and methods of obtaining them are likely to change in ways that are currently unknown. Further research is urgently needed to document the impact of changes in prescribing practices on pain pill availability and acquisition patterns.

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Table 1

Characteristics of the study participants. (n=390)

Participant Characteristics	N	(%)
Gender		
Male	213	54.6%
Female	177	45.4%
Race		
White	192	49.2%
African American	175	44.9%
Other	23	5.9%
Age		
18–20	199	51.0%
21–23	191	49.0%
Most common method of pharmaceutical opioid administration (past 6 months)		
Oral	326	83.6%
Intranasal inhalation	62	15.9%
Frequency of non-medical pharmaceutical opioid use (past 6 months)		
Less than 1 day per week	108	27.7%
1 to 2 days per week	189	48.5%
3 or more days per week	93	23.8%

Table 2

Sources of pharmaceutical opioids for non-medical use (n=390).

Source	Ever (select all that apply)	In the past 6 months (select the most common source)
Own prescription	184 (47.2%)	15 (3.8%)
Given free by friends	343 (87.9%)	114 (29.2%)
Given free by relatives	173 (44.4%)	44 (11.3%)
Bought	314 (80.5%)	210 (53.8%)
Took from relatives	80 (20.5%)	4 (1%)
Took from friends	42 (10.6%)	0
Doctor shopping	43 (11.0%)	2 (0.5%)
Internet	3 (0.8%)	0
Other	1 (0.3%)	1 (0.3%)

Table 3

Multiple logistic regression analysis: predictors of sources of pharmaceutical opioids (“active” role in pain pill acquisition versus “passive” role) for non-medical use in the past 6 months (n=390).

Variable	Odds ratio	95% CI	p value
Gender			
Male (vs. “female” as a reference group)	0.88	0.57–1.37	0.573
Race/ethnicity			
White (vs. “other” as a reference group)	1.76	1.08–2.84	0.022
Duration of illicit pharmaceutical opioid use (in years, continuous variable)			
	1.06	0.95–1.18	0.304
Frequency of non-medical pharmaceutical opioid use			
1–2 days/week (vs. “less than 1 day/week” as a reference group)	2.87	1.67–4.92	<0.001
3 or more days/week (vs. “less than 1 day/week” as a reference group)	4.96	2.58–9.54	<0.001
Non-medical use of OxyContin			
	1.76	1.04–2.97	0.034
Pharmaceutical opioid administration			
Snorting (vs. “oral use” as a reference group)	1.53	0.76–3.09	0.232
Reasons of use			
To get high and to self-medicate (vs. “self-medicate only” as a reference group)	2.35	1.22–4.52	0.010
To get high only (vs. “self-medicate only” as a reference group)	2.62	1.28–5.37	0.009

Hosmer-Lemeshow test: $X^2 = 2.033$, $df=8$, $p=0.980$ *

* The Hosmer-Lemeshow goodness-of-fit-statistic was used to assess if the model’s estimates fit the data at an acceptable level. Non-significant outcome (Hosmer-Lemeshow goodness-of-fit test statistic is greater than .05) indicates that the model prediction does not significantly differ from the observed, and thus the model has a good fit.