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PRESCRIPTION OPIOID USE: PATIENT CHARACTERISTICS AND MISUSE IN COMMUNITY PHARMACY

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Abstract

Objective—Opioid pain medication misuse is a major concern for U.S. public health. The purpose of this article is to: 1) describe the demographic and physical, behavioral, and mental health characteristics of patients who fill opioid medications in community pharmacy settings and 2) describe the extent of opioid medication misuse behaviors among these patients.

Design—We recruited and screened a convenience sample of patients using a tablet computer-based assessment protocol that examined behavioral, mental, and physical health. Descriptive and inferential statistics were calculated to describe respondents and their opioid medication misuse and health characteristics.

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Setting—Patients were screened in 2 urban and 2 rural community pharmacies in southwestern Pennsylvania.

Participants—Survey participants were adult patients filling opioid pain medications who were not currently receiving treatment for a cancer diagnosis.

Main Outcome Measures—Validated screening measures included the: Prescription Opioid Misuse Index, Alcohol Use Disorders Identification Test-C, Short-Form-12, Drug Abuse Screening Test-10, Primary Care Post-traumatic Stress Disorder (PTSD) screen, and the Patient Health Questionnaire-2.

Results—A total of 333 patients were screened (71.2% response rate). Nearly the entire population reported pain above and general health below national norms. Hydrocodone (19.2%) and morphine (20.8%) were found to be the medications with the highest rates of misuse—with hydrocodone having higher odds for misuse by more than four times compared to other medications (AOR=4.48; 95% CI=1.1–17.4). Patients with positive screens for illicit drug use (AOR=8.07; 95% CI=2.7–24.0), PTSD (AOR=5.88; 95% CI=2.3–14.7), and depression (AOR=2.44; 95% CI=1.0–5.9) also had significantly higher odds for misuse compared to those with negative screening results.

Conclusion—These findings provide important foundational data that suggest implementation of regular opioid misuse screening protocols within community pharmacies. Such screening activities could foster a culture of prevention and overall reduction for misuse among patients filling opioid medications in community pharmacies.

Introduction

The greater than 400% increase in population average dose of opioid medications sold between 1997–2007^[1] in addition to the estimates of 2.1 million individuals reporting the non-medical use of opioid pain medications^[2] make opioid medication misuse a serious public health problem in the U.S.^[3, 4] This national crisis is of particular concern because misuse of opioid medications commonly occurs concomitantly with serious health problems,^[5–7] including mental and behavioral health disorders^[5, 6, 8, 9] and various physical problems such as chronic pain,^[6, 9–12] hepatitis,^[5, 7] and overall poor health.^[8, 12] Once physical dependence on opioids is established, symptomology associated with withdrawal potentiates relapse and resumption of misuse.^[13] Fatal opioid medication overdoses from 2001–2013 increased more than 300%.^[14] Today, 44 individuals die each day from opioid medication overdose.^[15] Opioid medication misuse exacts a disproportionately heavy toll on rural populations who commonly are underserved with respect to social and health services.^[16–19] In addition to health and social implications, opioid medication misuse has an estimated cost of \$56 billion annually to the US economy.^[20]

Opioid medication misuse poses a significant challenge for effective community pharmacy practice.^[21–24] Community pharmacists are uniquely positioned to assume a stronger influence in averting the manifold problems associated with opioid misuse. These professionals are ranked among the most trusted professionals in the U.S.,^[25] and community pharmacies are easily accessible, with more than 60,000 community pharmacies

employing more than 170,000 pharmacists.^[26] This opportunity is further enabled by their convenient location where opioid medications are legally filled, but are subsequently misused by some patients.^[27, 28] Pharmacists report concern about opioid medication misuse, yet they also report that they do not have sufficient tools and training to effectively address this problem.^[21-24] Thus, by acquiring specific assessment, intervention, and referral skills, community pharmacists have the capacity to be major resources for addressing opioid medication misuse and are well positioned for mobilization with the skills and tools to address this ongoing epidemic. Having identified this opportunity for community pharmacy, we recently reported preliminary data from the first project of its kind that screened patients for opioid medication misuse (e.g., taking opioid pain medications more often/higher dosages than prescribed, for the feelings they cause, to cope with problems, and doctor shopping) in 1 urban and 1 rural community pharmacy (N=164).^[29, 30] Initial findings showed that 14.3% of community pharmacy patients evinced misuse. Factors predicting opioid misuse were positive screens for illicit drug use (AOR=12.96, 95% CI= 2.18–76.9) and post-traumatic stress disorder (PTSD; AOR=13.3, 95% CI= 3.48–50.66). Significantly, the vast majority of patients were agreeable (78.1%) to opioid screening and discussing misuse.^[29, 30] These data provided a first glimpse into the complex patient environment that exists in the community pharmacy setting, as pharmacists regularly care for individuals at-risk for and engaged in opioid medication misuse.

The present article reports results from our final sample of 4 pharmacies (2 urban and 2 rural) and doubles the number of patients in our preliminary sample. The intent of the current article is to have direct and practical clinical utility by assisting pharmacists in identifying misuse, understanding misuse and health characteristics, and caring for patients at-risk for opioid medication misuse. This article specifically advances our previous work by: first, examining the demographic and health problem characteristics (individual health problems that have been demonstrated to elevate risk for opioid medication misuse) of community pharmacy patients based on type of opioid pain medication filled; second, reporting associations between opioid medication misuse and (1) opioid pain medications being filled and (2) patient health problems; and third, reporting frequencies of individual misuse behaviors among community pharmacy patients positive for prescription opioid misuse. These data provide a potentially helpful and robust view into medication misuse patterns among a clinical population within community pharmacy settings. These data are especially valuable given that pharmacists often have limited information other than the type of medication being filled by their patients. Owing to the high prevalence rates of medication misuse, there is an increased need for preventive measures, including identification of patients who may require additional care and attention. Our larger goal with this project is to be transformative to the field—establishing necessary foundational evidence to support regular screening for opioid medication misuse and to support the development of clinical interventions delivered by community pharmacists.

Methods

Study Design and Sample

The study was conducted in 4 independent community pharmacies in southwestern Pennsylvania. These pharmacy locations were selected according to their willingness to partner in an opioid misuse screening project and their location within regions having high rates of misuse within the state.^[31] Staff at each pharmacy assisted in recruiting the sample by identifying potential respondents, which patients were physically present and filling any opioid pain medication at the pharmacy locations. Patients were first screened for eligibility using a computer tablet with preloaded questions. The inclusion criteria were patients must have: (1) been 18 years of age or older, (2) not been currently receiving cancer treatment, and (3) not previously completed the survey. Qualified prospective respondents were then provided with information via the tablet device about study goals, survey contents, investigator contact information, assurance of anonymity, and project exempt status with the University of Pittsburgh Institutional Review Board. Patients were also offered health and human services resources and referral information. Patients who completed the survey received a \$20 gift card. The study was funded by a University of Pittsburgh Central Research Development Fund grant.

Assessment Protocol

The survey was self-administered and contained a series of 45 questions that took approximately 10–15 minutes to complete. Demographic questions asked sex, age, work status, and level of education. The type of opioid pain medication being filled by patients was assessed using a single item that asked, “What is the name of your pain medication?” followed by a free-text box for respondents to type in the name. For comparability across patients, all medications were subsequently coded into generic names. Some patients (n=42, 12.2%) recorded 2 opioid pain medications being filled. In order to obtain point estimates for the relationship between misuse and the medications, we created separate binary variables for each medication reported.

Behavioral, mental, and physical health problems were screened using several brief, valid, and reliable screeners. The Prescription Opioid Misuse Index (POMI) contains 6 questions that screen prescription opioid misuse behaviors, with 2 or more affirmative responses indicating misuse.^[32] This survey specifically asks patients: (1) Do you ever use more of your medication, that is, take a higher dosage, than is prescribed for you? (2) Do you ever use your medication more often, that is, shorten the time between dosages, than is prescribed for you? (3) Do you ever need early refills for your pain medication? (4) Do you ever feel high or get a buzz after using your pain medication? (5) Do you ever take your pain medication because you are upset, using the medication to relieve or cope with problems other than pain? (6) Have you ever gone to multiple physicians including emergency room doctors, seeking more of your pain medication?

The Drug Abuse Screening Test-10 (DAST-10) contains 10 items that assess behaviors associated with drug use disorders,^[33] with one or more affirmative responses indicating a need for intervention.^[34] The DAST-10 is a recommended instrument for screening drug

abuse in research and clinical patient populations.^[35, 36] The Alcohol Use Disorders Identification Test-C (AUDIT-C) contains 3 items that screen alcohol use severity, with a score of 3 or more for women and 4 or more for men indicating hazardous alcohol use.^[37-39] The AUDIT-C has been widely used in health care settings with a variety of patient populations.^[39]

Physical health was assessed using the Short-Form 12 (SF-12). This measure contains 12 items that screen physical function and limitation related to health problems, has been tested in a variety of patient populations.^[40] For the current project, the Pain and General Health single-item subscales were used to measure physical health. These Likert scale items were dichotomized in the current project based on patients being above or below national population norms.^[41]

Mental health issues were screened using two scales. The Patient Health Questionnaire-2 (PHQ-2) contains two items that screen for general depression, with a score of 3 or more indicating depression.^[42, 43] The Primary Care Post-Traumatic Stress Disorder (PC-PTSD) screen contains four items that assess for PTSD, with a score of 3 or more indicating PTSD.^[44-46]

Analyses

Descriptive and inferential statistics were used to describe respondents and their health characteristics based on the type of opioid pain medication reported. Summary statistics of responses for individual items from the POMI among patients positive for misuse (i.e., positively affirmed 2 of the behaviors of the 6 POMI items) who reported filling the 2 most frequent opioid medications, hydrocodone and oxycodone, were also calculated. Logistic regression was used to examine univariate and multivariable relationships between prescription opioid medication misuse, opioid medication type, and health conditions that are known risk factors for misuse. Multivariable models were adjusted for age, gender (male=1, female=2), pharmacy location (rural pharmacy A=1, rural pharmacy B=2, urban pharmacy A=3, urban pharmacy B=4), education level (high school=1, >high school=2), employment status (not employed=1, employed=2). All analyses were conducted using Stata 14.0 SE.^[47]

Results

A total of 333 patients completed the survey from September 2014 to June 2015. The average response rate across the 4 pharmacies was 71.2% (rates: rural pharmacy A= 94.2% [98 completed/104 approached]; rural pharmacy B= 13.3% [75 completed/565 approached], urban pharmacy A=87.7% [100 completed/114 approached]; urban pharmacy B=92.3% [60 completed/65 approached]). We acknowledge the low response rate for the rural pharmacy B; however, we compared responses from this pharmacy with the other 3 pharmacies by age, gender, education level, employment status, opioid misuse, illicit drug use, hazardous alcohol use, pain, general health, depression, and PTSD. Results showed no significant differences among respondents with the exception of rural pharmacy B having 70.7% of their respondents compared to 52% of other locations reporting high school or less than high school education ($\chi^2=8.3$, $df=1$, $p=0.004$), and all of their respondents compared to 92.9% in

the other locations having a positive screen for pain above national norms ($\chi^2=5.6$, $df=1$, $p=0.02$). Given these consistent similarities and limited differences for demographic and health conditions, we retained the rural pharmacy B sample in this analysis.

Demographics and Health

Table 1 shows demographics and the health screening results for participants who filled each of the specific medication types reported. With the exception of oxymorphone (37.5%) and methadone (36.4%), the majority of patients filling medications were females. All respondents were approximately 50 years of age ($SD=12.4$), and 43.8% had completed more than high school. Fentanyl users had the highest average age (Mean=61; $SD=8.6$) and proportion completing more than high school (69.2%). The majority of respondents also reported being unemployed (69%). The largest proportions of respondents who reported being unemployed were hydromorphone (100%) and morphine (96%) users.

In terms of health, opioid medication misuse was reported among 15.1% of all patients, with the largest proportions among morphine (20.8%) and hydrocodone users (19.2%). Illicit drug use in the past year was reported by 8.7% of respondents, with fentanyl users being the largest portion of patients who screened positive (15.4%). Over one-fifth of respondents reported hazardous alcohol use, with hydrocodone users screening positive most often (28.5%). In terms of pain interfering with daily activities and poor health exceeding U.S. norms, patients were almost universally positive (pain: 93.8–100%; poor health: 86.8–100%). For mental health, 26.6% of respondents screened positive for depression, with morphine users (48%) screening positive more frequently than other patients. Finally, 16.5% of respondents screened positive for PTSD, with methadone users screening positive most often (22.2%).

Opioid Medication Misuse

Table 2 shows the results of the univariate and multivariable logistic regression analyses that examined the association between prescription opioid medication misuse and medications filled as well as health conditions reported. In the univariate associations, hydrocodone use had a modest association with misuse that did not reach significance ($p=0.09$). Drug use within the last year was associated with the highest odds for patients screening positive for opioid medication misuse ($OR=4.70$, $SE=2.02$, 95% $CI=2.0-10.9$), followed by a positive screen for PTSD ($OR=4.15$, $SE=1.45$, 95% $CI=2.1-8.2$) and depression ($OR=3.38$, $SE=1.08$, 95% $CI=1.8-6.3$).

In terms of the multivariable analysis, hydrocodone use was associated with a 4.48 times higher odds for misuse when compared to other medications ($SE=3.11$, 95% $CI=1.1-17.4$). Behavioral health and mental health factors also resulted in higher odds for positive misuse. Patients with a positive screen for illicit drug use in the past year had a more than 8 times higher odds for misuse ($SE=4.49$, 95% $CI=2.7-24.0$) when compared to those with negative screens. Those with a positive screen for depression had a 2.44 times higher odds for misuse ($SE=1.09$, 95% $CI=1.02-5.9$), and those with a positive screen for PTSD had a near 6-fold higher odds for misuse ($SE=2.76$, 95% $CI=2.3-14.7$) when compared to those with negative screens. A negative screen for pain that interferes with daily activities above national norms

reduced respondents odds for misuse by 83% compared to those with positive screens (SE=0.13, 95% CI=0.04–0.8).

Hydrocodone and Oxycodone Misuse Behaviors

Table 3 displays descriptive statistics for the individual POMI indicators among patients that were positive for misuse (i.e., positively affirmed 2 of the behaviors of the 6 POMI items) within the 2 most commonly reported medications. Misuse behaviors among hydrocodone and oxycodone users most commonly included using medications more often than was prescribed (hydrocodone= 80.1%, oxycodone= 94.4%), followed by taking higher dosages than prescribed (hydrocodone= 72%, oxycodone= 72.2%), and needing early refills (hydrocodone= 65.4%, oxycodone= 50%). Going to multiple doctors or emergency rooms was the least common endorsed indicator of misuse (hydrocodone= 11.5%, oxycodone= 11.1%).

Discussion

The results of this analysis confirm previous findings and advance the field in terms of understanding patient characteristics, health conditions, and opioid medication misuse among patients filling opioid medications in community pharmacies. Community pharmacy represents a major untapped resource in the health care field that is well-positioned to make a significant impact for addressing opioid medication misuse. Often, however, pharmacists possess limited information about patients to whom they are dispensing medications aside from the type of medication being filled. A central aim of this project was to examine and inform community pharmacists what, if any, patterns and relationships existed between opioid medication misuse and (1) the type of opioid pain medications filled by patients and (2) health problems that heighten risk for opioid medication misuse. Our results also provide a potentially valuable glimpse into patients' specific behaviors that comprise misuse. These findings offer potentially valuable information that, when confirmed by future research, provides support for implementing regular opioid medication misuse screening protocols within pharmacies to allow for needed pharmacist-led interventions for patients at-risk or engaged in misuse. Such screening could ideally involve employing the assessment battery utilized herein. By administering these screening measures, community pharmacists can take confidence in implementing a tested protocol with reliable and valid measures to identify physical, mental, and behavioral health concerns among potential patients.

Health Problems that Heighten Chances for Misuse by Type of Medication Filled

Patients who completed the health screening reported a number of problems that were associated with opioid medication misuse, with a number of conditions reported more frequently among patients with certain types of medications. In regards to behavioral health, users of fentanyl, although numerically small (n=13), represented the highest proportion of patients with illicit drug use in the last year (15.4%). This finding coincides with previous research that documents clear trends for the presence of multiple illicit substances among individuals who have had a fatal fentanyl overdose.^[48] Users of oxycodone followed in illicit drug use rates in the last year (9.8%), which is also supported in both clinical and epidemiological literature showing regular abuse of oxycodone among illicit drug

users^[49-51] and the presence of multiple illicit substances in cases of overdose deaths involving oxycodone.^[52]

In addition to illicit drug use, nearly 30% of hydrocodone users and 20% of oxycodone users screened positive for hazardous alcohol use. This is compared to 10% of other types of opioid pain medications for which hazardous alcohol use was reported in this project. Nationally, approximately 6% of those who have non-medical use of opioid pain medications report alcohol use,^[53] and roughly 10% of patients identified as opioid medication abusers have alcohol abuse/poisoning codes in national health claims analyses.^[7] Our rates of hazardous alcohol use among hydrocodone and oxycodone users suggest a possible disparity between national levels and should be confirmed by future research. Confirmation of these disparities among the different types of opioid medication filled could offer important information for pharmacists given higher chances for misuse and overdose among patients who drink alcohol and take opioid pain medications.^[54-56]

In terms of physical health, nearly the entire screened population, regardless of medication type, reported pain above and general health below national norms. Specifically examining pain, higher than national norms could be expected given that the SF-12 screener asks patients about pain in the last 4 weeks, and treatment of pain is indicated for each of these medications. However, in terms of poor general health, this response was not expected. The general health screening question on the SF-12 does not limit responses to a specific time period, is asked first in the list of questions before time periods are introduced, and assesses health generally. Knowing that proportions of patients ranging from 86.8% of hydrocodone users to 100% of morphine, oxymorphone, hydromorphone, and methadone users have overall poor health could guide pharmacists as they interact with these patients and dispense these medications. There is significant value in this information given the higher odds of misuse among patients with poor health^[8, 12] and the valuable opportunity pharmacists could have to make referrals to specialized care to address these conditions. We acknowledge, however, that our screening survey did not ask patients regarding care they were currently receiving for any of their health conditions, and therefore, patients could have been receiving active treatment. However, regardless of possible current care received, community pharmacists possessing such detailed information at the point of medication dispensing is vitally important and supports the need for routine proactive multidimensional health screening. Given this importance, implementing brief physical and behavioral health screening tools, such as those used in this study, can optimize community pharmacists' understanding of patient health and possible needs for prevention interventions and referral for additional care.

Prescription Opioid Misuse

Our results are in-line with national figures for opioid medications filled. Our data demonstrate that hydrocodone and oxycodone were the primary medications filled by patients within our sample. These findings are consistent with previous literature showing these two medications account for the largest sources of pain medications filled in the nation.^[57] Our analysis also shows distinct characteristics for patients filling opioid medications, with approximately 15.1% of patient reporting misuse. It is important to

recognize that misuse herein was self-reported. Previous clinical research has shown that as high as 20% of patients seeking care for pain tend to underreport previous opioid medication consumption.^[58] As such, the proportion of patients in this project reporting misuse could be considered a possible lower threshold in the actual numbers of patients engaged in misuse.

Nonetheless, our data show that hydrocodone (19.2%) and morphine (20.8%) appear to be the medications that have the highest rates of misuse proportionately within the sample. In addition, hydrocodone is the only pain medication reported that significantly heightened patients' odds for positive opioid medication misuse (AOR=4.48; 95% CI=1.1–17.4) when adjusting for other opioid pain medications, demographics, and health indicators. This positive relationship should be viewed as tentative, requiring additional research, and by no means indicates that those filling this medication should necessarily be treated differently than other patients. Rather, as these results should be confirmed by future investigations, such findings may suggest pharmacists should seek to obtain a multidimensional understanding of hydrocodone users' health before taking any potential action. This is imperative given that this significant relationship becomes most evident when accounting for demographics and other known risk factors for opioid medication misuse. Active screening using the POMI measure appears to not only be feasible in terms of workflow, given its brevity, but it likewise provides a reliable and valid source of objective information for community pharmacists to assess possible misuse. In terms of additional health indicators, our findings are also generally consistent with previous research as it appears that patients with positive screens for mental and behavioral health problems had higher odds for misuse. However, while remaining significant, the strength of associations between health risk factors for misuse and the POMI misuse indicator were somewhat modulated in the current analysis (N=333) compared to our previously published results (N=162).^[29] For instance, illicit drug use in our previous analysis possessed one of the strongest associations with misuse (AOR=12.96, 95% CI=2.18–76.9). In the current analysis, this relationship remained significant, possessed the strongest relationship with misuse, but was lessened in strength (AOR=8.07, 95% CI=2.7–24.0). These current estimates are nonetheless consistent with national health claims analyses that have demonstrated significant relationships between opioid medication misuse and illicit drug use disorder diagnoses (AOR=1.78, 95% CI=1.27–2.48).^[6] In addition to the strength of these associations, the larger sample size in the current analysis compared to our previous work appears to have aided in narrowing the width of the confidence intervals associated with all estimates, which likely has produced more reliable estimates of associations between positive misuse and the included indicators.

Our previously published estimates for PTSD (AOR=13.3 95% CI=3.48–50.66) had the strongest association with positive misuse.^[29] However, the current estimates had modulated magnitudes and were not the strongest predictor of misuse in our multivariable model (AOR=5.88, 95% CI=2.3–14.7). These significant relationships between PTSD and positive misuse are also nonetheless consistent with those previously reported in health claims analyses (AOR=2.45, 95% CI=1.88–3.19).^[5] In addition to PTSD, depression was significantly associated with misuse in the current analysis, raising odds for misuse in the univariate model by 3.38 times (95% CI= 1.8–6.3) and 2.44 times in the adjusted model (95% CI=1.02–5.9). Such estimates for depression are similar to previously published analyses of large health claims databases that reported significant associations between

depression diagnoses and opioid medication abuse (AOR=2.52, 95% CI=2.17–2.93).^[5] Given this information, it appears critical that community pharmacists vigilantly screen not only physical and behavioral health issues, but mental health risk factors as well using brief measures, such as the PHQ-2 and PC-PTSD. Such activities would provide important health information for possible prevention, intervention, and/or referral services for patients.

The current project also analyzed which specific behaviors that constitute misuse were most common among misusers with the most frequently reported opioid pain medications, hydrocodone and oxycodone. The misuse measure employed in this study, the POMI, captures 6 specific behaviors that constitute misuse when 2 or more are indicated simultaneously (sensitivity= 0.82, specificity =0.92).^[32] Early refills, taking medication more often than prescribed, and consuming higher dosages than prescribed were the most common behaviors patients reported. Taking opioid pain medications for their psychoactive effects, for coping with problems, or shopping for prescribers were the most infrequent behaviors reported. As pharmacists employ clinical measures such as the POMI and engage patients regarding possible medication misuse, it is likely that focusing on these more common behaviors related to adherence in targeted medication therapy management (MTM) sessions^[59–63] could yield significant reductions in misuse. Such targeted MTM sessions have demonstrated efficacy for a number of physical/behavioral health conditions.^[59–62] These sessions could be employed to aptly attend to opioid medication adherence and help connect patients with other health services to treat issues driving early refills and consuming medications too frequently and at dosages higher than prescribed. Our team recently published a model for such an intervention,^[63] which we are currently moving into the clinical trial phase for efficacy testing. Results of this forthcoming research may be informative to pharmacy educators and practicing pharmacists regarding effective ways to help patients who misuse and provide a tool to help pharmacies address quality measures around opioid use.^[64] Indeed, given that the pharmacy is the location where multiple prescriptions, for multiple health problems, from multiple prescribers are filled; it is highly appropriate that pharmacists take a lead in managing opioid medication misuse and taking preventative measures by referring patients to care for health issues that increase risk for misuse.

We acknowledge that incorporation of regular screening and intervention into community pharmacy would require shifts in training, practice, and workflow. However, in the case of training, there currently is a template for dissemination. Nationally, there is recognition of the liability of addiction among pharmacists in the field.^[65, 66] This recognition of addiction within the profession has propelled excellent initiatives to structure and disseminate substance abuse prevention and treatment education in training programs for students and practicing pharmacists.^[66] Such initiatives within universities aimed at assisting pharmacists with addiction could act as a model for the establishment of intervention training aimed at patients who misuse opioid pain medications.

Limitations

Despite the overall response rate, sample size, and regional nature of pharmacies from which these data were collected; these findings are nonetheless limited in their ability to be

generalized to populations beyond those included in the sample. Additionally, given the cross-sectional nature of this project, causal inference is not possible, and thus associations herein should not be considered explanatory. Future research should work to expand the areas in which community pharmacies are located for screening in order to enable data collected to be generalizable to state and/or national populations. Such work would likely require support from a large pharmacy professional organization, such as the American Pharmacist Association or National Community Pharmacists Association, in connecting community pharmacies to researchers on a statewide or national basis. Increasing the area in which data is gathered could also help increase the sample size of the project. An increased sample size would be particularly helpful for calculating estimates of misuse for less frequently reported pain medications.

Future research would also benefit from gathering more in depth data from patients. The screening surveys selected in the current study were chosen based in large part on their brevity in order to reduce patient burden within the busy pharmacy environment. Confirming patient self-report through longer diagnostic instruments and/or biochemical measures could help elucidate patient severity and validity of problems reported. Increased depth of information could also include attaining patients' releases to link survey data with prescription drug monitoring program data. Connecting detailed physical, behavioral, and mental health information to system-level monitoring information could also benefit patient care and provide rich information for potentially improving drug monitoring programs and policies nationally. Such an approach also has the ability to assist both pharmacy and prescribing professionals understand the complex needs patients have that undergird misuse that may be better addressed by health interventions rather than punitive actions. We acknowledge, however, that implementing these activities in community pharmacy will require efforts across the field, from educators to practitioners. This project hopefully will serve as the foundation for future research that will work to not only replicate the findings herein but to also devise methods for broad and effective implementation. Finally, it is important to note the first 18 patients screened in this project were assessed before the October 6, 2014 rescheduling of hydrocodone from a schedule III to a schedule II drug.^[67] However, no significant differences were found for demographic, health, or hydrocodone use for patients screened before compared to after the effective date.

Conclusion

Prescription opioid medication misuse is a serious national public health problem that continues to require concerted efforts from health professionals across the continuum of care. Pharmacists are among the most highly trained and trusted professionals in the U.S., and community pharmacies are common across the nation, existing in most communities. Community pharmacy, therefore, represents a possibly potent and scalable resource to address opioid medication misuse. The findings from this project documented that a non-trivial portion of patients filling opioid pain medications are positive for opioid medication misuse—with higher rates of misuse among hydrocodone, morphine, and oxycodone users. This study has also demonstrated that patients filling opioid pain medications have a number of concomitant health conditions that were associated with misuse. Community pharmacists will make important contributions for the advancement of behavioral health care and will

reduce opioid medication misuse as they continue to engage patients in medication management activities around adherence to opioid medication prescription regimens. Important contributions will also follow as community pharmacists assist patients who misuse or are at risk for misuse to obtain services to address health problems that fuel misuse or likelihood of misuse. Such changes have the potential to transform community pharmacy practice and the lives of patients who misuse opioid pain medications.

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Key Points

- Opioid pain medication misuse is a serious concern for public health and for community pharmacy.
- This paper reports characteristics of patients who displayed misuse behaviors in community pharmacies.
- These findings demonstrate possible need for routine opioid medication misuse screening and development of clinical intervention protocols for community pharmacists.

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^aMean and standard deviation

Table 2

Pain medication and health conditions associated with misuse (N=333)^a

Indicator	Univariate				Multivariable ^b			
	OR	SE	p	95% CI	AOR	SE	p	95% CI
Hydrocodone	1.70	0.53	0.09	(0.9–3.1)	4.48	3.11	0.03	(1.1–17.4)
Hydromorphone	0.50	0.53	0.51	(0.1–4.0)	3.34	4.36	0.36	(0.3–43.2)
Oxycodone	0.98	0.31	0.94	(0.5–1.8)	1.91	1.35	0.36	(0.5–7.6)
Morphine	1.54	0.81	0.42	(0.5–4.3)	3.34	2.51	0.11	(0.8–14.6)
Methadone	0.62	0.66	0.65	(0.1–5.0)	1.30	1.73	0.85	(0.1–17.8)
Drug use	4.70	2.02	0.00	(2.0–10.9)	8.07	4.49	0.00	(2.7–24.0)
Hazardous alcohol use	1.70	0.61	0.14	(0.8–3.4)	1.31	0.60	0.56	(0.5–3.2)
Poor general health	1.28	0.65	0.63	(0.5–3.5)	2.77	1.99	0.15	(0.7–11.3)
Pain interfering with daily activities	0.56	0.33	0.33	(0.2–1.8)	0.17	0.13	0.03	(0.04–0.8)
Depression	3.38	1.08	0.00	(1.8–6.3)	2.44	1.09	0.046	(1.02–5.9)
Post-traumatic stress disorder	4.15	1.45	0.00	(2.1–8.2)	5.88	2.76	0.00	(2.3–14.7)

^aOxymorphone and fentanyl not included due to no misuse reported by patients filling these medications;^bModel adjusted for age, gender (male=1, female=2), pharmacy location (rural pharmacy 1=1, urban pharmacy 2=2, urban pharmacy 1=3), education level (high school=1, >high school =2), employment status (not employed =1, employed =2).

Table 3

Misuse behaviors reported among those with positive misuse by most commonly filled medications

POMI indicator	Hydrocodone (n=26)	Oxycodone (n=18)
	%	
Do you ever use more of your medication, that is, take a higher dosage, than is prescribed for you?	72.0	72.2
Do you ever use your medication more often, that is, shorten the time between dosages, than is prescribed for you?	80.1	94.4
Do you ever need early refills for your pain medication?	65.4	50.0
Do you ever feel high or get a buzz after using your pain medication?	19.2	33.3
Do you ever take your pain medication because you are upset, using the medication to relieve or cope with problems other than pain?	23.1	5.6
Have you ever gone to multiple physicians including emergency room doctors, seeking more of your pain medication?	11.5	11.1