

Risk factors for drug diversion in a pain clinic patient population

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INTRODUCTION

Prescription drug abuse is newsworthy, and the incidence has grown at the alarming rate of 400 percent between 1998 and 2008.¹ Prescription drugs are the second most commonly abused category of drugs, behind marijuana and ahead of cocaine, heroin, and methamphetamine.² In 2008, about 2 million emergency department (ED) visits resulted from drug misuse or abuse, including more than 900,000 ED visits involving nonmedical use of prescription or over-the-counter pharmaceuticals or dietary supplements. The number of drug-related ED visits increased by more than 70 percent between 2004 and 2008.

Nonmedical use of prescription psychotherapeutic drugs is defined as use of these substances without a

ABSTRACT

Background: Prescription drug abuse and drug diversion have soared at the same time prescribing practices have increased, prompting the pain medicine community to seek more accurate knowledge of the sources of prescription drugs used nonmedically.

Objective: To determine the extent of drug diversion and its risk factors in patients treated in a pain clinic.

Methods: An anonymous patient survey was developed based on factors examined for their association with diversion identified from a literature search. Patients were asked to participate as they arrived for appointments at six chronic pain management clinics. Questions ascertained whether patients had experienced drug loss, theft, or diversion and, if so, the number of episodes. Data were analyzed to determine associations between identified risk factors and the following four identified ways of diverting prescription medications: stolen medications, lost medications, sharing of medications, and selling of medications. Data were also analyzed to determine the extent of drug diversion within the studied population.

Results: Respondents had experienced a 45 percent incidence of some form of drug diversion on at least one occasion. The most common type of drug diversion was loss due to theft, reported by 30 percent of the respondents. Findings suggest family history of drug abuse and a history of criminal behavior can increase likelihood of drug diversion.

Conclusions: Drug diversion in a pain clinic population was common in this brief survey. Such diversion may contribute to the problems of nonmedical use of prescription drugs.

prescription of the respondent's own or simply for the experience or feeling the drug caused.³ Although it is possible for persons having a prescription to misuse the medications for nonmedical purposes, the purpose of this study is to explore the nonmedical use of prescription psychotherapeutic drugs facilitated through diversion.

Drug diversion can include loss or theft of prescription medications from the patient, giving the medication to a friend or family member, or deliberately selling or trading medications.⁴ Commonly abused prescription drugs include opioids, benzodiazepines, psychotropic drugs and stimulants,⁵ and a study by the Center for Drug and Alcohol Studies⁶ suggests that pain clinics are contributing to the diversion and abuse of prescription drugs. Therefore, this study has

focused on the diversion of opioids in a pain clinic; however, benzodiazepines or other psychotherapeutic drugs were not excluded in the survey questions.

It has been unclear how to reduce diversion of opioids, because little is known about the sources or methods of diversion. The increase in nonmedical use has been correlated with the increase in the number of available medications in our communities.⁶ Concurrently, an increase in the prescribing of opioids, stimulants, and benzodiazepines is correlated with an increase in overdose ED visits and overdose deaths. Accidental overdose deaths increased in the United States from 2,891 in 1999 to 8,541 in 2005.⁷

Pain medicine prescribers, together with law-enforcement agencies, have determined that there is a need to understand the extent and risk factors for diversion.⁸ Data from research have suggested that prescription opioids are most commonly obtained from a dealer, from a friend or relative, or from a doctor's prescription.^{9,10} The Center on Addiction and Substance Abuse report of August 2010 indicated that 25 percent of teens know a friend who abuses prescription drugs.¹¹ These teens are obtaining their prescription drugs from parents' medicine cabinets and other family members.¹² Inciardi and colleagues have reported on the sources of drug diversion in no specific order:

- the illegal sale of prescriptions by physicians and pharmacists;
- "doctor shopping";
- theft, forgery, or alteration of prescriptions;
- robberies and thefts from manufacturers and distributors;
- thefts of prescription pads and institutional drug supplies;
- residential burglaries;
- cross-border smuggling by traffickers and tourists;
- medicine cabinet thefts by housekeepers, home repair personnel, and family members; and
- Internet shipments.^{13,14}

It could be inferred that patients who visit a chronic pain clinic every month and receive prescription opioids may be at heightened risk for drug diversion. Patients with pain who are uneducated on the safekeeping of medications can inadvertently be sources of drug diversion by becoming a target for theft of their medications.¹⁵ Stories abound of patients who "loaned their Lortab" to a friend, mother, son, spouse, or colleague. How much diversion this route constitutes is unknown. Neither is it known how much diversion is accounted for by patients who actively seek prescription medications solely for the purpose of selling them.¹⁶

No studies address the specific issue of drug diversion in the pain clinic patient population. An extensive survey¹⁷ evaluated patients with pain for drug abuse but did not provide data on the number of positive answers to the two drug diversion questions. Consequently, pain practitioners have little means to help them determine who is at risk for drug diversion. To examine this question, an anonymous pain clinic patient survey was developed and conducted in six pain clinics. The objectives of this project were as follows:

1. Determine the extent of drug diversion in a pain clinic patient population.
2. Determine risk factors for drug diversion in a pain clinic patient population.

METHODS

Literature search

The literature was reviewed for all references to diversion or nonmedical use of prescription drugs. Key words included diversion, abuse, nonmedical use of prescription drugs, nonmedical use of opioids, and illicit drug use. Databases of Pub Med, CINAHL, Cochrane Review, The Department of Justice, The Office of Drug Control Policy of the White House, Researched Abuse, Diversion, and Addiction-Related Surveillance System (RADARS), the Substance Abuse and Mental Health Services Administration and the National Drug Intelligence Center were reviewed.⁷ Searches were limited to the past 10 years, humans, and text available in English. The US Census Bureau was accessed to define the size of a metropolitan area and rural area.¹⁸ There were 82 resources reviewed and, of those, 40 were referenced and cited.

The literature search identified several factors for examination as follows:

1. *Age*.^{2,5,14-16,19,24} Studies suggest persons aged between 18 and 25 are more likely than any other age group to use illicit drugs, including nonmedical use of prescription medications. This statistic is well established and widely accepted in the literature. Age groups were defined from Hall et al.²⁰

2. *Gender*.^{2,16,21,24,25} In 2009, illicit drug use or prescription opioid drug abuse was higher among males than females. This was similar to previous studies. The rate for males was 10.8 percent of the general population of males aged 12 and above versus 6.6 percent of the females who were questioned in this survey. The rate of nonmedical use for both sexes was 0.8 percent for benzodiazepines and 0.2 percent for amphetamines.

3. *Education*.^{26,27} In 2009, among adults aged 18 and above, illicit drug use was lower in persons who were college graduates (6.2 percent). The highest rate was among those who did not graduate from high school (10.2 percent). A review of RADARS also confirmed this trend.

4. *History of binge drinking or heavy drinking of alcohol (EtOH)*.^{16,19,24,25,28} The propensity for persons who have a history of alcohol abuse to divert drugs is well documented in multiple studies. Questions to isolate the history of binge or heavy drinking are efficient and easily identified. This project used the question as presented in the 2009 National Survey on Drug Use and Health.

5. *Size of the community in which the patient resides*.^{2,10,20,29} Disparities exist in reports of how community size affects the risk of drug diversion. Cicero et al. report that rural communities have greater drug diversion than metropolitan areas. The National Survey on Drug Use and Health reports greater illicit drug use in major metropolitan areas. Rosenblum et al.¹⁰ believe that the discrepancy is because of less availability of heroin in rural areas. In those areas, drug seekers turn to prescription drugs. In metropolitan areas, heroin is more available and less expensive to purchase.

Cicero et al.²⁹ report that rural and suburban areas are at higher risk for nonmedical prescription drug use than are major metropolitan areas. The question in the survey of this project attempts to define the rate of diversion in rural, suburban, and metropolitan areas. The size of the community was defined according to the US Census guidelines for rural, suburban, or metropolitan areas.

6. *Socioeconomic status*.^{26,30,31} Financial strain is proposed as a strong predictor of deviant behavior. The proposal is that persons seeking extra income and money to pay bills will often be tempted to sell their prescription medications. In a cross-sectional analysis, needy families in distressed areas were more likely to obtain oxycodone prescriptions. The implication is that the oxycodone is sold for cash or other needed services.

7. *Employment status*.^{24,26,27,32} In a systematic review in 2008, Manchikanti et al. reported an increase in drug diversion and illicit drug use during the past 10 years. Lack of employment was highly associated with drug diversion and illicit drug use. This finding is also confirmed in a review of the RADARS data.

8. *History of criminal behavior*.^{24,27} Criminal behaviors are well-established risk factors for drug diversion and abuse. Persons who have been in prison or jail, especially for drug-related charges, are more likely to be associated with drug diversion. Persons who have been charged with driving under the influence are also considered at increased risk for drug abuse and diversion. For the purposes of this survey, respondents who reported having used their prescription drugs in an inappropriate way for recreational purposes (eg, snorting, shooting up, sniffing, and chewing) or persons who reported use of illicit drugs were considered to have a history of criminal behavior.

9. *Marital status*.²⁰ There is some evidence that marital status has an effect on the propensity for drug diversion. An observational study of overdose deaths in West Virginia by Hall et al. found that single persons were more likely to have been involved in drug diversion than married, divorced, or widowed persons. It may be that the lifestyle of young single adults is more conducive

to drug diversion than is the sedentary lifestyle of middle-aged married people.

10. *Failure to keep medications secure.*^{24,33} Theft and loss of prescription medications is pervasive among all communities. There are no studies about the effectiveness of keeping medications locked as a way to prevent theft. However, the Utah Division of Occupational and Professional Licensing requires healthcare providers to instruct patients to lock up their medications. The state of Utah also has implemented a medication-safety program that includes instruction to the public to lock all medications in a safe place. The Drug Enforcement Administration promotes this same practice, which has been implemented in many other states. Despite lack of empirical evidence that locking medications helps prevent drug diversion, the pervasiveness of medication loss and theft led to the decision to include a question about patients keeping medications locked.

11. *Type of medication obtained from the pain clinic.*³⁴⁻³⁶ Oxycodone, hydrocodone, and methadone are suggested to be the most sought-after prescription drugs for illicit use. It was deemed essential to add a question regarding the type of medications the patient obtains.

12. *A family history of drug abuse or family history of use of illicit drugs.*^{19,37} A family history of drug abuse or illicit use is a known risk factor for drug abuse by an individual. This has been widely validated in the Opioid Risk Tool.³⁸

Setting

This project was conducted in six pain clinic settings. Limits of funding and time restricted the availability and access to more clinics. Sixteen clinics were contacted and asked to participate (three in Virginia, three in West Virginia, one in Kentucky and nine in Utah). Of those contacted, five in Utah and one in Virginia agreed to participate. The survey was offered to respondents during a 30-day period in October 2011.

Population

The respondents consisted of patients in a chronic pain clinic who were aged 18 or above. All eligible

patients who visited the clinic on the days the survey was available were invited to participate. The refusal rate for patients approached was less than 1 percent. Respondents were not given an incentive to complete the survey. Respondents understood that their participation was voluntary and not reimbursed.

Survey development and procedures

The survey was developed by the principal investigator based on the 12 risk factors identified in the literature, feedback in person and via electronic communication from content experts, and a framework developed from routine activity theory.³⁹ Twenty-four questions were designed to obtain data regarding the identified risk factors as either a yes/no answer, or on a Likert scale with 0 indicating no incident and 1-5 indicating the number of times the incident had occurred. Four specific questions were developed to identify the following four types of drug diversion that could occur: stolen medications, lost medications, sharing of medications, and selling medications. The four diversion questions were worded to identify any incidents in the past year. Each of the diversion variable questions could be answered on a Likert scale of 0-5. Of the remaining 20 questions, 19 were used to determine the extent of association of the 12 risk factors with the four types of drug diversion. Questions 5-8 and 10 assessed socioeconomic status. Questions 16, 17, 19, and 22 assessed the respondent's history of criminal behavior. The purpose of questions 18 and 20 was to assess the respondent's contributory family history. Questions of a sensitive nature were asked in more than one way to increase the likelihood of an accurate response. Question 24 was an addendum added to the survey upon recommendation of content experts to assess the extent of "doctor shopping" in the population.

Age groups identified by Hall et al.²⁰ in a large study of abuse and overdose were used for the purposes of this study. Size of the community question was based on the US Census Bureau guidelines for rural, metropolitan, and small town.¹⁸ Economic status questions were based on US Census 2010 guidelines for poverty level.

The clinic office staffs were trained in the appropriate administration of the survey. Patients were approached to take the survey, and those who agreed were given a choice of paper-and-pencil or a Web-based survey. Differences between those taking a paper-and-pencil survey and a Web-based

survey were not measured. The patients were informed that the survey was anonymous, were provided privacy for completing the survey, and were assured that no data were tracked and no recrimination possible. The internal review board of the University of Utah granted an expedited review and determined that the study was exempt from the federal regulations governing human research. The survey was available from September 29, 2011 to November 7, 2011. The goal was to obtain 500-700 responses.

Statistical analysis

Statistical analyses were carried out using the Pearson R, Mantel-Haenszel chi-square test, and chi-square tests available in the SAS software package for analysis of complex samples survey data. Data derived from the survey were nonparametric in nature and analyzed using the Pearson correlation statistic. The diversion variables (Table 1) were analyzed with each survey answer associated with the proposed risk factor. If there was at least one statistically significant relationship in the associated questions, the proposed risk factor was included in the recommendations as a possible risk for drug diversion.

The diversion variables were analyzed for associations with the other 20 questions. The Pearson correlation coefficients and p values of the associations are shown in Table 1. p values were deemed to be statistically significant if they were less than 0.05. The Row Mean Scores Differ statistic was used for the chi-square comparisons. If the answers to the question could be ordered in some way (ie, low, medium, or high; a ranking from 1 to 5), the item was identified as ordinal (questions 2, 4-6, 9, 11, 13-17, 19, 23, and 24). The four questions related to diversion variables were ordinal data (yes/no answers). When compared with answers to a question that were deemed as nominal (questions 18-22), the Row Mean Scores Differ statistic, derived from the Mantel-Haenszel chi-square test, was used to determine the p value. In cases where both the diversion variable and the answers to the question were deemed ordinal, the Pearson correlation statistic was used to determine the p value.

RESULTS

Demographics

There were 352 respondents with a 93 percent completion rate. The respondents were 46 percent

male. The most prominent age group was 45-54 years of age (38 percent). Less than 1 percent of the responses were from patients aged 18-24. Persons aged 25-34 represented 9 percent and aged 35-44 represented 20 percent. Those persons aged more than 55 represented 33 percent of the responses.

A significant majority of respondents were married, whereas only 5 percent were widowed, 9 percent were never married, and 21 percent were divorced. Most respondents (64 percent) had attended at least some college, compared to 26 percent who had only a high school education and 10 percent who did not graduate from high school.

The economic status of respondents was more evenly distributed: 36 percent reported receiving government assistance; 37 percent reported income more than \$50,000 a year; 30 percent were in the middle range; and 14 percent were considered in the poverty level. Respondents were allowed to answer more than one item on this question, as persons can receive government assistance and be considered middle income or higher (eg, Social Security Income).

Forty-two percent of the respondents did not work, and 13 percent responded yes to the question asking if they were looking for and could not find work. Also, 48 percent reported having difficulty buying food or paying bills in the past year. Fifty percent of the respondents reported living in a community larger than 50,000, whereas 41 percent reported living in a small town, and 9 percent reported living in a rural community. Most respondents (92 percent) gave a positive response to the question "Do you have health insurance?"

Survey

Analysis of the completed surveys determined that 45 percent of the respondents reported some form of drug diversion at least once (Table 2). Stolen medication was the most prevalent method of drug diversion with 30 percent (n = 192), of the respondents reporting at least one incident of stolen medication and 2 percent reporting having their medications stolen five times or more. When asked if the medications had been locked up when they were stolen, 19 percent reported they were locked and secure when stolen; 20 percent reported they were not. No statistically significant correlation was observed.

Lost medications were the second most common reason for drug diversion with 20 percent (n = 70)

Table 1. Pearson coefficients and p values of correlations between risk factors and types of drug diversion

Question #	Question name		Sharing	Lost	Sold	Stolen
1. Age						
Q 1	Age	Pearson	-0.013	-0.14	-0.07	-0.13
		p value	0.80	0.01	0.20	0.01
2. Gender						
Q 2	Gender	Pearson	-0.01	-0.000	-0.03	-0.00
		p value	0.84	0.99	0.49	0.99
3. Education						
Q 4	Education	Pearson	0.12	0.06	0.06	0.05
		p value	0.03	0.26	0.29	0.37
4. History of EtOH abuse						
Q 23	EtOH	Pearson	0.03	0.03	-0.00	0.04
		p value	0.52	0.51	0.98	0.44
5. Size of community						
Q 9	Community	Pearson	-0.01	0.04	-0.00	0.10
		p value	0.79	0.42	0.89	0.06
6. Socioeconomic status						
Q 5	Income	Pearson	0.008	0.003	-0.07	-0.073
		p value	0.88	0.94	0.18	0.19
Q 7	Looking for work	Pearson	-0.04	0.03	-0.01	0.00
		p value	0.48	0.57	0.79	0.86
Q 8	Financial strain	Pearson	-0.04	0.15	-0.00	0.17
		p value	0.41	0.006	0.88	0.002
7. Employment						
Q 6	Employment	Pearson	0.03	0.08	-0.05	0.00
		p value	0.51	0.14	0.34	1.0
8. History of criminal behavior						
Q 16	DUI	Pearson	-0.002	-0.005	-0.02	0.05
		p value	0.97	0.92	0.64	0.39
Q 17	Arrested	Pearson	0.05	0.02	0.01	0.01
		p value	0.33	0.68	0.78	0.77

Table 1. Pearson coefficients and p values of correlations between risk factors and types of drug diversion (continued)

Question #	Question name		Sharing	Lost	Sold	Stolen
Q 19	Used illicit drugs	Pearson	0.15	-0.07	0.12	0.04
		p value rm*	0.006	0.19	0.03	0.44
Q 22	Snorting	Pearson	0.22	0.009	0.05	0.10
		p value rm*	<0.001	0.86	0.33	0.07
9. Marital status						
Q 3	Marital status	Pearson	0.02	-0.03	-0.07	-0.16
		p value	0.67	0.58	0.19	0.003
10. Failure to keep medications secure						
Q 12	Locked meds	Pearson	0.10	0.13	-0.06	0.11
		p value	0.29	0.17	0.51	0.25
11. Type of medication						
Q 21	Type of meds	Pearson	-0.01	0.02	-0.001	0.10
		p value rm	0.81	0.69	<0.001	0.06
12. Family history of abuse						
Q 18	Family Hx of abuse	Pearson	0.18	0.12	0.12	0.22
		p value rm*	0.001 [†]	0.02 [†]	0.02 [†]	<0.001 [†]
Q 20	Family Hx of illicit use	Pearson	0.22	0.19	0.07	0.22
		p value rm*	<0.001 [†]	<0.001 [†]	0.17	<0.001 [†]

*rm = row mean score.

[†]The most frequent statistically significant correlations with the four diversion variables are a family history of drug abuse and a family history of use of illicit drugs.

reporting at least one or more incidents of lost medications. There was a significant association with several of the 12 proposed risk factors as indicated in Table 1. There was a significant correlation between a family history of drug abuse and all forms of drug diversion. There was a significant correlation between history of criminal behavior in the subcategory of history of drug abuse and number of times medications were shared ($p = 0.007$) and number of times medications were sold ($p = 0.033$). These two correlations have low power due to the small number of respondents reporting yes on the questions of selling and sharing their medications.

Financial strain, a component of the proposed risk factor socioeconomic status indicated by question 8 (difficulty paying bills), was correlated with lost ($p = 0.0064$) and stolen medications (0.0022). Using medications in a different way from the way they were intended (snorting, etc), a subcategory of history of criminal behavior, was correlated significantly with marital status ($p < 0.001$) and number of times medications were shared ($p < 0.001$). This last statistic also had low power due to the low number of respondents reporting an answer greater than zero.

The type of medication received by the patient from the clinic was correlated with selling. The

Table 2. Incidence of drug diversion by type and frequency of incident

Number of incidents	Type of diversion, n (percent)			
	Sharing (n = 340)	Selling (n = 336)	Stolen (n = 338)	Lost (n = 38)
0	304 (89 percent)	330 (98 percent)	238 (70 percent)	272 (80 percent)
1	16 (5 percent)	4 (1 percent)	54 (16 percent)	42 (12 percent)
2	4 (1 percent)	1 (0 percent)	26 (8 percent)	21 (6 percent)
3	5 (1 percent)	0	10 (3 percent)	5 (1 percent)
4	0	0	2 (1 percent)	1 (0 percent)
5 or more	11 (3 percent)	1 (0 percent)	8 (2 percent)	1 (0 percent)

incidence of positive response to selling was less than 2 percent; therefore, the data were skewed, and the results of this particular proposed risk factor response cannot be considered reliable. The results showed low incidence of criminal behavior. Only 7 percent reported having had charges of driving while intoxicated, 13 percent reported having a history of arrest, 8 percent reported using illicit drugs, 2 percent reported using medications inappropriately, and 15 percent reported using alcohol inappropriately.

The incidence of family history of arrest or criminal behavior and family history of illicit drug use was high with 43-46 percent of the respondents reporting yes to at least one of the two questions. Those respondents with less than a high school education reported more sharing of medications. The number of respondents in the less than high school category was two of 327 responses. Therefore, this data may be skewed.

No statistical correlation or relationship was observed between the medications being locked versus unlocked when they were stolen. This question had three possible answers: "yes, they were locked," "no, they were not locked," or "I have never had medications stolen": 19 percent reported they were locked when stolen, 20 percent reported they were not locked when stolen, and the remainder (61 percent) reported never having medications stolen.

Having a history of binge drinking, employment, size of community, and sex were not correlated with any of the four means of drug diversion. There were no significant relationships identified with question 24 (doctor shopping). The age of the patient was negatively correlated with stolen medications (Table 3). The age group 35-44 years reported the highest

frequency of 38.7 percent. Marital status was significantly associated with stolen medications (Table 4). Divorced persons reported the highest frequency (38 percent) of having medications stolen.

DISCUSSION

Approximately 45 percent of the participants reported at least one incident of drug diversion by type. Interpretation of the risk factor findings suggests family history of drug abuse and a history of criminal behavior can increase likelihood of drug diversion. This is not an unexpected finding. Opportunities for crime to occur are increased in persons with family history of drug abuse due to the proximity of predators (family members). Opportunities for drug diversion increase for persons who have a history of drug abuse due to the increase in the availability of "hot products" and increased opportunity due to regular medication renewals.³³

The theory of routine activity³⁹ would imply that not keeping medications locked would increase the likelihood of having them stolen. This study did not find data to support that theory. Interestingly, the state of Utah has implemented a program to encourage locking and safekeeping of medications. Many national agencies are also beginning to support the practice of locking prescription drugs. It appears that further research is needed in this area to determine the effectiveness of the locked medications programs.

Respondents who indicated a marital status of divorced were at increased risk of drug diversion in the results of this survey. This finding was in contrast to a 2008 study in which Hall et al. found that single persons were more likely to have participated in drug

Table 3. Frequency of stolen medications per age group

Age group	How many times medications stolen							Total # of respondents	Percent of responses
Frequency (percent)	0	1	2	3	4	5			
18-24	2 (100.0)	0 (0.00)	0 (0.00)	0 (0.0)	0 (0.0)	0 (0.0)	2	0	
25-34	19 (65.52)	5 (17.2)	1 (3.45)	2 (6.9)	0 (0.0)	2 (6.9)	29	35	
35-44	38 (61.29)	14 (22.5)	6 (9.68)	1 (1.6)	0 (0.0)	3 (4.8)	62	38.7	
45-54	76 (63.87)	18 (15.1)	16 (13.4)	5 (4.2)	2 (1.68)	2 (1.68)	119	36	
>55	81 (80.20)	14 (13.86)	3 (2.97)	2 (1.98)	0 (0.00)	1 (0.99)	101	19.8	
Total	216	51	26	10	2	8	313	30.9	

Frequency missing = 14.

Table 4. Frequency of stolen medications per marital status

Marital status	How many times medications stolen							Total # of responses	Percent of responses greater than 0
Frequency (percent)	0	1	2	3	4	5			
Never married	19 (67.86)	3 (10.71)	3 (10.71)	0 (0.00)	0 (0.00)	3 (10.7)	28	32	
Divorced	39 (61.90)	12 (19.05)	3 (4.76)	4 (6.35)	0 (0.00)	5 (7.94)	63	38	
Widowed	7 (63.64)	2 (18.18)	2 (18.18)	0 (0.00)	0 (0.00)	0 (0.00)	11	36	
Married	148 (71.84)	33 (16.02)	17 (8.25)	6 (2.91)	2 (0.97)	0 (0.00)	206	28	
Total	213	50	25	10	2	8	308	30.8	

Frequency missing = 19.

diversion.²⁰ However, the 2008 study addressed diverted drugs in overdose deaths; therefore, its findings are not comparable to those of this survey. Further research of this proposed risk factor is needed.

Respondents between the 35-44 years of age were at increased risk for incidents of drug diversion, most often in the form of stolen medications. Other literature suggests that adolescents and young adults are more likely to participate in nonmedical use of prescription drugs.² The results of this survey may be different due to the small sample size. Also, adolescents were not included as eligible participants in the survey. The findings of this survey may reflect the family relationships of the 35-44 age group. Many of this age group do have adolescents in the home and may be

experiencing stolen medications for that reason. The “hot items,” the opportunity, the target, and the perpetrator all converge in the homes of these families.

Socioeconomic status was associated with some risk of diversion. Respondents who reported financial strain showed an increased risk of lost and stolen medications. The other two questions relating to socioeconomic status were not significantly associated with the diversion variables. Respondents were asked if they were currently employed with a simple yes/no response. No significance was identified between employment status and any type of drug diversion. Further studies are needed to determine the extent of the effect of socioeconomic status on drug diversion risk.

Clearly, some drugs of these patients are diverted through carelessness of the patient, by having them stolen or lost. However, it remains unclear what the motives may be for a patient with pain to divert drugs. Some have conjectured that patients are in need of money, and selling prescriptions can be lucrative.¹⁴ The data are clear that one of the primary sources of prescription drugs for nonmedical use is friends and family.^{9,14,23,40}

The key barriers of this study were lack of consistent participation by patients and low sample size. Limited funds for conducting research and time constraints were responsible for low sample size. Less than half the 16 clinics approached were willing to participate in the survey. Failure of the office staff in the clinics to recommend the survey to patients was an additional reason for obtaining fewer respondents than the goal. The survey population was drawn from pain clinic practices within a limited geographic area. The sample size was adequate but ideally could have been more representative if the sample size had been larger. A survey of this type would ideally enroll 1,000-2,000 subjects to provide sufficient power to adequately reflect the nationwide population of the pain clinic patient.

The survey relied on the honesty of the respondents when answering questions. The extent to which answers were given truthfully is unknown. Nevertheless, it was assumed that most patients would answer the questions truthfully. The 2010 ADAMII report,²⁷ a survey of arrestees in the criminal justice system, indicated that respondents answered truthfully to questions about drug use and abuse ~85 percent of the time. The sample for this study was not systematically randomized but a sample of convenience, and participation in the survey was voluntary. Assumptions in developing a survey are that all surveys are imperfect and collect imperfect data, especially voluntary surveys and those without controls.

The studied pain clinic population may have demographic characteristics that are not equivalent in all aspects to adolescents, young adults, criminals, or others who may be actively diverting drugs. This study attempted to identify risk factors in the population of known drug diverters and apply these risk factors in the form of questions to the pain clinic population. The proposed factors may not translate transparently to the pain clinic population. It is possible that persons who were involved in criminal activity with their prescription medications chose not to respond to the survey.

RECOMMENDATIONS

This project has brought to light some information for practitioners in the pain management setting. Questions have also been raised about how the habits, family history, and lifestyles of patients affect their likelihood of participating in drug diversion. The research should be continued and expanded. An extensive survey with a diverse population base and more extensive statistical analysis can prove to be extremely valuable to pain clinic providers. Ideally, samples could be taken from the East Coast, Northwest, and the Southern states. These can be collected most efficiently by a Web-based survey. University-based pain management specialists should be involved in the project to provide academic expertise.

Patients should be considered at most risk for drug diversion when they have a positive family history of drug abuse. A personal history of criminal behavior and the age group 35-44 should also be considered as possible risk factors based on this brief survey. This survey also demonstrated a positive correlation between divorced persons and increased risk of having medications stolen. Financial strain in the household should be considered a high-risk variable for lost or stolen medication.

Practitioners caring for patients with pain should be cautious in providing prescription medications for patients at risk. An extensive patient-education plan on the safekeeping of medications to reduce theft should be developed or adapted through the state department of professional licensing. Patients should also be educated on reasons why they should not share medications with family members or friends. Pain clinic patients should be screened at their initial visit for history of drug abuse, illicit drug use, family history of drug abuse or illicit use, marital status, age, the presence or absence of health insurance, and the presence or absence of financial strain in the household. Patients at risk should be monitored closely. Patients should be informed that lost or stolen medications will not be replaced. The practitioner who identifies persons at moderate-to-high risk can do more frequent urine drug screens, check state controlled-substance databases more frequently, re-evaluate the physical exam frequently, limit the amount and type of prescriptions given, and see the patients more often. These precautions could potentially help reduce the amount of prescription drugs being diverted to the streets.

CONCLUSION

Identification of patients who are at risk for drug diversion remains a challenge. This brief project and survey suggests that the prevalence of any type of drug diversion in a pain clinic setting is 45 percent, a significant problem. The most common reason for drug diversion is having medications stolen. The age and marital status of the patient have shown an association with reports of drug diversion. Patients with a family history of drug abuse or illicit drug use were shown to be at significantly greater risk for drug diversion. Selling and sharing medications were not common practices among this population. Some studies or reviews have implicated pain clinic patients as a source of criminal activity in selling medications. This project demonstrates that patients with pain do not appear to be a major source of the criminal drug-selling problem. However, medication theft appears to be a considerable contributor to the prescription medications that are diverted to nonmedical users. Routine activity theory³⁹ explains the problem of drug diversion as a crime of opportunity. Patients are known to have desirable drugs, and when they are placed in association with family members who are known to be drug seekers, the patients become opportunistic targets of crime.

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