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Use of the Internet to Obtain Drugs without a Prescription Among Treatment-involved Adolescents and Young Adults*

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Abstract

Nonmedical use of prescription drugs is common and poses risks such as injury, overdose, and development of abuse and dependence. Internet pharmacies offer prescription drugs without a prescription, creating a source of illicit drugs accessible to anyone with an Internet connection. We examined this issue in a convenience sample of 1,860 adolescents and young adults from 24 residential and outpatient treatment programs. Few individuals obtained drugs from the Internet ($n = 26$, 2.3%). Pain relievers were the most frequently purchased type of drug. The majority of adolescents and young adult online purchasers made the purchases from their own or a friend's house.

I. Introduction

Nonmedical use of prescription drugs is the second most common form of illicit drug use in the United States and poses significant risks, including accidental injury, overdose, and development of addiction (Takeshita, 2003; Lineberry & Bostwick, 2004; St George et al., 2004; Paulozzi, Budnitz, & Xi, 2006; Nielsen & Barratt, 2009). In 2012, the National Survey on Drug Use and Health (SAMHSA, 2013) estimated that 6.8 million Americans aged 12 and older (2.6% of population aged 12 or older) used prescription drugs non-medically in the past month. An estimated 4.8 million individuals used analgesics, 2.1 million used tranquilizers, and 1.2 million used stimulants non-medically in the past month (SAMHSA, 2013).

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In the case of prescription pain reliever misuse in particular, increases since the 1990's have paralleled increases in doctors' prescribing of these medications in the United States (Okie, 2010; Weisberg et al., 2014). At the same time, Internet use became more widespread throughout the late 1990's and early 2000's and there was a marked increase in sales of prescription drugs on the Internet (Fentiman, 2004). As demand for prescription drugs has risen, so has the proliferation of both legitimate (licensed, prescription required) and illegitimate Internet pharmacies that provide prescription drugs to individuals (Larson, 2002; Weiss, 2006; Brand, 2007; Orizio, et al. 2011; Fittler, et al. 2013). While online pharmacies that deliver legally-obtained and authentic drugs to consumers with legitimate prescriptions from doctors can make it easier and more convenient for patients to obtain their medicines, there are potential harms associated with drugs delivered from online pharmacies operating outside legal channels.

According to the website LegitScript, which monitors and evaluates online pharmacies, there are 33,579 active online pharmacies that the website has deemed to be not legitimate, meaning that they lack licensure, dispense prescription medications without a prescription, or otherwise fail to meet LegitScripts standards (LegitScript, 2015). Only a relative handful of online pharmacies have been deemed legitimate or potentially legitimate by LegitScript (212 and 1,819 respectively) (LegitScript, 2015). Many studies have been carried out to examine the characteristics of online pharmacies according to a systematic review of the topic (Orizio, et al. 2011). For example, the National Center on Addiction and Substance Abuse at Columbia University (CASA, 2008) identified 159 websites that offered controlled prescription drugs, of which 85% did not require a prescription to purchase these controlled drugs. In a long-term study of 136 internet pharmacies, 56 of them were found to be consistently operational throughout a four-year period and only 9 of the 120 pharmacies that sold prescription medications required a prescription from the purchaser (Fittler, 2013).

Internet pharmacies have been under increased regulatory scrutiny (Boyer & Wines, 2008) and steps have been taken to combat the problems associated with illegitimate pharmacies. The Ryan Haight Online Pharmacy Consumer Protection Act was enacted in 2008 and Federal Agencies including the Drug Enforcement Administration (DEA), Food and Drug Administration (FDA), U.S. Immigration and Customs Enforcement (ICE), and the U.S. Postal Inspection Service have cooperated in both domestic and international investigations (United States Government Accountability Office (GAO), 2013). While these efforts have resulted in closure of several large Internet drug operations (see Schifano et al., 2006; The National Center on Addiction and Substance Abuse at Columbia University, 2008), these regulations and operations may be less effective in addressing the problem internationally (Inciardi et al., 2009). In the U.S., the National Association of Boards of Pharmacy developed the Verified Internet Pharmacy Practice Sites (VIPPS) program designed to evaluate and accredit online pharmacies (National Association of Boards of Pharmacy, 2015). To achieve accreditation, online pharmacies must comply with rigorous standards pertaining to licensing, prescription requirements, location of the business within the U.S., privacy practices, among others. The European Commission has followed suit, recently developing an official logo to be displayed on online pharmacy websites indicating that they are operating legally (European Commission, 2015).

Within the U.S., lack of resources and jurisdictional constraints have prevented individual states from contributing significantly to efforts to curb illegitimate pharmacies' operations (GAO 2013). In 2010, three major Internet search engines (Bing, Google, and Yahoo!) adopted policies to address these problems. Specifically, these search engines prohibited sponsors from placing pharmacy advertisements on search result pages (typically above or to the side of the search results) unless they were VIPPS) certified *and* operated in compliance with United States pharmacy laws and practice standards (National Drug Intelligence Center, 2011).

Despite such policies, a substantial number of illegitimate online merchants continue to appear in Internet search results. At the time of this writing (March 2014), we conducted a series of Google™ searches of several commonly abused prescriptions (i.e., Xanax – a benzodiazepine, Vicodin – an opiate, and Ritalin – a stimulant) using the methodology of Forman et al. (2006). Specifically, each of the three searches crossed the drug name with the term “no prescription” (e.g., Vicodin “no prescription”). We then examined the first 20 results of each search to mimic what an average person might do when searching a topic online. Results for the Xanax search indicated that 35% (n = 7) of the first 20 results linked to online illegitimate pharmacies (i.e., those selling medications without requiring a valid prescription). Similar results were observed for the Vicodin (65%, n = 13) and Ritalin (85%, n = 17) searches. The high prevalence of these online merchants points to the continuing demand for these illicit drugs through the Internet.

In order to take measures to prevent the potential harms associated with purchasing prescription drugs online from illegitimate pharmacies, it is necessary to ascertain who the customers are, which has not been an easy task. According to the National Survey of Drug Use and Health (SAMHSA, 2012), only .3% of individuals in the general population who reported nonmedical use of prescription pain relievers indicated that they had obtained them via the Internet. It is possible that sub-groups of the general population are the consumers and that they are under-represented when looking at the general population as a whole. For example, several studies have explored the possibility that college students may be a primary consumer of online prescription drugs. However, results from these studies found low rates of such online purchasing ranging from 0–6% (Inciardi et al., 2010; Garnier-Dykstra, Caldeira, Vincent, O'Grady, & Arria, 2012). These and other studies suggest that the Internet is not source of prescription drugs used nonmedically by college students (McCabe, 2005). Similarly, it has been postulated that treatment-seeking adults may comprise the bulk of illegitimate online pharmacy consumers. However, recent research indicates that this is unlikely, with rates of online purchases of prescription drugs ranging between 1% and 6% in several studies (i.e., Cicero et al., 2011; Gordon, Forman, & Siatkowski, 2006; Inciardi, Surratt, Kurtz, & Cicero, 2007; Inciardi et al., 2010; Jena & Goldman, 2011; Rosenblum et al., 2007).

One sub-population that has yet to be examined or ruled out as a primary online consumer of prescription drugs is adolescents and young adults who are currently in treatment for substance abuse and dependence. There are several reasons to hypothesize that this group may be illegitimate Internet pharmacies' primary consumers. First, this demographic group comprises some of the main users of the Internet. According to the Pew Internet & American

Life Project, 95% of 12–17 year old and 18–29 year old Americans go online (Madden et al., 2013) and nearly 50% report making online purchases (Lenhart et al., 2010). Second, nonmedical use of prescription opioids, sedatives and tranquilizers by adolescents and young adults has increased substantially over the years (e.g., Johnston, O'Malley, Schulenberg, & Bachman, 2006; Setlik, Bond, & Ho, 2009; Zosel, Bartelson, Bailey, Lowenstein, & Dart, 2013). For example, the prevalence of *lifetime* misuse of prescription analgesics among adolescents ages 12–17 was .83% in the 1960's (Sung, Richter, Vaughan, et al., 2005) while the rate of *current* misuse was 1.7% in 2013 (SAMHSA, 2014). Third, unlike their adult counterparts, adolescents may not have the same direct access to or relationship with their doctors to obtain prescriptions for these drugs. This would substantially reduce the likelihood of them receiving unnecessary prescriptions or “doctor shopping”, which has been cited as a contributing factor to opiate abuse and dependence (e.g., Volkow & McLellan, 2011). Finally, unlike those in the general population surveyed by the NSDUH project, adolescents and young adults in substance abuse treatment meet diagnostic criteria for abuse or dependence and, thus, may be more likely to engage in unconventional forms of drug-seeking behavior. This study examines Internet drug acquisition in a large cohort of adolescents and young adults (12–25 years old) enrolled in substance abuse treatment programs throughout the United States.

2. Methods

2.1 Program recruitment

We sought to enroll approximately 30 large treatment programs to obtain a target sample of 1800 in-treatment adolescents and young adults (~60 per program). We approached 102 large, residential adolescent addiction treatment centers that participated in an earlier initiative by Falco, one of the authors of this article, “Treating Teens: a Guide to Adolescent Drug Programs” (Drug Strategies, 2003). The programs were contacted by telephone, mail, and e-mail about participation in the study. We provided programs with a brief overview of the project and informed them that they would receive a \$750 stipend for participation. Interested programs completed a brief screening that assessed the following information: 1) treatment modality (i.e., inpatient, outpatient, long-term residential or detoxification), 2) number of new adolescents admitted per month for treatment, 3) primary source of referral for admitted adolescents (i.e., family, police/courts, or schools); and, 4) proportion of out-of-state clients. A minimum of ten attempts at initial contact were made for each center. Of the initial 102 programs, 17 agreed to participate and met eligibility criteria of serving adolescents and young adults ages 12–25 years and having a monthly intake of at least 5 clients. The remainder of the programs (n = 85) did not participate for a variety of reasons (i.e., 10 could not be reached, 2 had closed, 3 no longer treated adolescents, 1 no longer provided addiction treatment, 6 had a limited census, 6 cited concerns regarding institutional approval of the study, 6 did not have computer access, and 51 were not interested in participating). To supplement the sample, we selected 7 additional programs from the Substance Abuse and Mental Health Services Administration's (SAMHSA's) online addiction treatment resource.

Although the sample was not intended to be nationally representative, the programs were located throughout the United States (4 in the Midwest, 4 in the Northeast, 7 in the South, 9 in the West). Nine percent of the centers were residential facilities, 17% were outpatient programs, and 74% offered both inpatient and outpatient services. Program size varied greatly, with average monthly intakes ranging from 5 to 163. A majority of programs (75%) reported that most patients resided in the local area. Most programs received both private and public funding (54% received at least some private; 83% received at least some public funding). Referral sources varied among the programs, with 83% receiving criminal justice referrals, 45% receiving family referrals, and 29% receiving schools referrals.

Each participating program received a start-up kit that included a training manual which detailed all project procedures, specified participant inclusion criteria (i.e., adolescent and parent/guardian could provide informed assent and consent, respectively), and explained survey administration. We provided participating programs with a comprehensive web training that covered human subject protections, data collection, and record-keeping to ensure standardization of the protocol. We monitored study implementation and quality assurance through regular telephone and email contacts with program staff.

2.2 Sample and procedures

A total of 1860 adolescents and young adults participated in the study between May of 2010 and August of 2011. Participants were recruited by program staff at intake from consecutive admissions to the treatment programs. This resulted in a 92% participation rate. For adolescent patients (aged 12–17), treatment program personnel reviewed study procedures with both the parents and the adolescent. Parental consent and adolescent assent were required to participate. When written parental/guardian permission could not be obtained in person, treatment staff obtained consent via telephone. All parents received a copy of the consent form. For young adults (aged 18–25), parental consent was not required and treatment program personnel reviewed study procedures with potential participants who provided written informed consent. Following the consent/assent process, all participants received an envelope containing log-in instructions on how to access the anonymous web-based survey either at the treatment program or at their home. All participants received a \$10 Amazon gift code upon completion of the 20–30 minute online survey. These study procedures were overseen by the Institutional Review Board at the Treatment Research Institute (Philadelphia, PA).

2.3 Measures

The 20–30 minute web-based survey included questions related to participants' demographic characteristics, substance use, treatment histories, and methods of obtaining drugs and alcohol, with specific questions about Internet purchasing. Questions about drug use closely followed the format used in the National Survey on Drug Use and Health (SAMHSA, 2012) and included age of onset, lifetime, past-year and past-month frequency. For each type of drug used, participants were asked how it was obtained and response options were as follows: a) Bought on the Internet; b) Took from friend/relative without asking; c) Given for free by friend or relative; d) Bought from friend or relative; e) Bought from drug dealer/stranger and f) Other method. For the current paper, we examined rates of Internet

purchasing of prescription drugs for nonmedical use among adolescents and young adults who reported nonmedical prescription drug use in the past year (i.e., pain relievers, stimulants, and tranquilizers). We examined how and where these purchases were made in addition to methods of payment and receiving of goods.

2.4 Data Analysis

The analyses were performed using the sub-sample of individuals who reported nonmedical use of prescription drugs in the past year ($n = 1107$). Descriptive statistics were calculated to determine the number and percentage of individuals who reported purchasing prescription drugs online. For those who made online purchases, we calculated frequencies for items examining the ordering and shipping location, method of payment, and additional sources used to obtain prescriptions drugs. Finally, for those making purchases via credit or debit card, we calculated frequencies regarding to whom the card belonged. All the statistical analyses were performed using SAS® 9.2 (SAS® Institute Inc.).

3. Results

3.1 Sample characteristics

Out of the total sample of 1,860 subjects, 1,107 adolescents and young adults (59.5%) reported nonmedical use of prescription drugs during the past year (Table 1). They were 17.4 years of age ($SD = 2.8$) on average. The majority was male and white, and about half had a history of substance abuse treatment. Pain relievers were the most frequently used prescription drugs (used non-medically) in the past year ($n = 970$, 52.2%) followed by stimulants ($n = 705$, 37.9%) and tranquilizers ($n = 609$, 32.7%).

3.2 Prevalence of online purchasing

Only a small number of these individuals ($n = 26$, 2.3%) purchased prescription drugs online (Table 1). Pain relievers were the drugs most frequently purchased online ($n = 15$, 57.7%), followed by stimulants ($n = 11$, 42.3%), and tranquilizers ($n = 8$, 30.8%). Similar to the overall sample, those who made online purchases tended to be male ($n = 18$, 69.2%) and white ($n = 16$, 61.5%) with an average age of 19.04 ($SD = 2.8$) years.

3.3 Ordering and shipping location

All 26 individuals made at least one online prescription drug purchase from a friend's house ($n = 26$; 100%) (Table 1). Fifteen (58%) purchased online from their home, seven from school (27%), five "on the go" (19%), and two from a public library (8%). All 26 individuals had at least one order shipped to a friend's house ($n = 26$; 100%), with fewer shipping the purchase to their home ($n = 8$; 31%), to a P.O. box (23%) or to a relative's house ($n = 3$; 12%).

3.4 Method of payment

The primary method of payment used for online purchases was a credit or debit card ($n = 17$, 66%), followed by PayPal ($n = 8$; 31%), cash on delivery (COD; 6; 23%), cash by mail ($n = 4$; 15%), and personal check or money order ($n = 2$; 8%) (Table 1). Among those individuals

who used a credit or debit card for purchases, 29% (n = 5) used their own card, 29% (n = 5) used a stolen card, two (12%) used a friend's card, and one individual (6%) used a parent's card. An additional 12% (n = 2) reported making purchases using a pre-paid debit card. Finally, one person (6%) indicated that they had used cards from all of the sources cited above and one refused to answer.

3.5 Additional sources of prescription drugs

As reported earlier, the Internet was not the sole source of prescription drugs for adolescents and young adults who reported online purchases (Table 1). These participants also reported obtaining the drugs from friends and/or family, with 20 (77%) having been given them by friends or relatives for free, 19 (73%) having bought them from friends or relatives, and 18 (69%) taking them from friends or relatives without asking. In addition, 15 (58%) reported buying the drugs from a drug dealer or a stranger.

4. Discussion

The pervasiveness of illegitimate Internet pharmacies raises questions about who constitutes their primary customer base. Previous studies have ruled out several populations including adults in the general population, treatment-seeking adults, and college students. Less than 3% of nonmedical users in this sample of adolescents and young adults in addiction treatment obtained prescription drugs from online sources.

Although the limited number of adolescents and young adults who made online purchases rules them out as the primary consumer base, the current study provides useful information on how this population obtains illicit prescription substances. First, the Internet does not appear to be the sole source of these drugs as the large majority of the group also reported obtaining them from friends and/or family. Importantly, over two thirds of the sample reported taking these drugs from friends and/or family members without asking. These findings are consistent with various reports indicating that teens often gain access to prescription drugs from medicine cabinets, purses, and other locations within their own or other's homes. This underscores the need for parents to take steps to eliminate access to prescription drugs that could be used nonmedically. Second, all 26 individuals reported making Internet drug purchases from friends' homes and more than half of individuals made purchases from their own homes. This highlights the importance of parents' monitoring online behavior not only within their own homes but also taking necessary steps to reduce maladaptive Internet use on the part of their adolescents at their children's friends' homes.

Actionable steps could include placing computers in common areas of the home, reviewing Internet history lists on computers and tablets, using parental control software, speaking candidly with friends' parents about your rules about unmonitored computer use and other concerns, and monitoring phone and text records for unknown numbers, calls at unusual hours, or high-frequency calls to particular numbers. Finally, findings indicated that nearly one third of the sample had the drugs shipped directly to their home. Although a parent's decision to inspect their children's mail may depend on the child's maturity and prior behavior, in many cases and particularly with adolescents and young adults who have

reached the point of requiring substance abuse treatment, such inspections may be warranted.

The complexity and covertness of these illegitimate pharmacies are well-documented (Orizio et al, 2009 & 2011, Bate & Hess, 2010). They have been shown to operate across multiple countries; supply, banking, distribution, and website activities operate out of different locations, with the ability to quickly change locations to avoid detection and prosecution. As a result, there should be a concerted effort to educate the public about the dangers of purchasing drugs from illegitimate pharmacies and highlight strategies for identifying safe, legitimate online pharmacies. Coupled with increased efforts to identify and shut down illegitimate online pharmacies, these measures could go a long way in reducing the number of consumers who are exposed to potentially harmful prescription drugs.

Having ruled out treatment-seeking adolescents and young adults, researchers can continue this process of deduction by examining other potential consumer groups. For example, it is possible that individuals involved with the criminal justice system use these online suppliers. Dealers of illicit prescription drugs may purchase their supply from these sites. This population may be under-represented in national surveys, making their identification as consumers less likely. It is also possible that older or elderly individuals may represent the consumer base. They may have come into contact with pain medications through their physicians and turn to the Internet when they no longer have legitimate access to the drugs. Many individuals who are underinsured might be purchasing prescription drugs online, especially if they believe it is less time-consuming or less expensive than visiting a physician and obtaining the drugs through a local pharmacy. Another possibility is that the consumer base is very diverse, with no one group acting as primary customers. Finally, it is possible that the general population estimates for Internet purchasing of illegal prescription drugs may be underestimated because of issues related to data collection. For instance, the NSDUH collects information related to drug source for the drug most recently used nonmedically. If source questions were asked for *all* prescription drugs used nonmedically in the past year, it is possible that higher rates of online purchasing would be observed. As such, we would recommend that the NSDUH and similar surveys be modified to collect information in this manner.

The current study has several limitations. First, the sample, while geographically diverse, is not nationally representative. Consequently, the findings may not be generalizable to adolescents and young adults in drug treatment throughout the entire country. Future studies could be conducted to establish the generalizability of the current findings. A second limitation of the study is that it relies entirely on self-reports collected via the Internet. Although the validity of self-report web-based surveys has been established among older adolescents and young adults (McCabe, Diez, Boyd, Nelson, & Weitzman, 2006), it is not known whether this method of data collection can accurately estimate online purchasing behavior.

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Table 1

Sample characteristics and use of the internet to obtain prescription drugs without a prescription, number and percentage of sample

	All Subjects (N=1,860)	
Age: Mean (SE)	17.4 (2.8)	
	N	%
Male	1,217	65.4%
White race/ethnicity	1,200	64.5%
History of substance abuse treatment	810	43.6%
Nonmedical prescription drug use	1,107	59.5%
Pain relievers	970	52.2%
Stimulants	705	37.9%
Tranquilizers	609	32.7%
	Online Purchasers (N=26, 2.3%)	
Age: Mean (SE)	19.04 (2.8)	
Male	18	69.2%
White race/ethnicity	16	61.5%
Type of drug purchased online		
Pain relievers	15	57.7%
Stimulants	11	42.3%
Tranquilizers	8	30.8%
Location from which order placed		
Friend's house	26	100%
Own home	15	58%
School	7	27%
On the go	5	19%
Public library	2	8%
Location to which order shipped		
Friend's house	26	100%
Own home	8	31%
P.O. box	6	23%
Relative's house	3	12%
Payment method		
Credit or debit card	17	66%
PayPal	8	31%
Cash on delivery	6	23%
Cash by mail	4	15%
Personal check or money order	2	8%
Additional sources of prescription drugs		
Friends and/or family: free	20	77%

	All Subjects (N=1,860)	
Friends and/or family: purchased	19	73%
Friends and/or family: stolen	18	69%
Dealer or stranger: purchased	15	58%

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