



Factors associated with history of non-fatal overdose among young nonmedical users of prescription drugs

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ABSTRACT

Objectives: The current study examines the prevalence and correlates of lifetime non-fatal overdose (OD) involving the nonmedical use of prescription opioids and tranquilizers among a sample of high-risk young adults in New York, NY and Los Angeles, CA.

Methods: Data were derived from a cross-sectional study of 16–25 year old nonmedical users of prescription drugs ($n = 596$). Unadjusted associations between OD history and socio-demographic and drug use variables were investigated in bivariate logistic regression models. Multivariate logistic regression models identified correlates of non-fatal OD.

Results: Lifetime prevalence of non-fatal overdose involving prescription opioids and/or tranquilizers was 23.6%. Factors associated with increased risk of non-fatal overdose included lower social class while growing up (OR: 1.81, 95% CI: [1.15, 2.83], $p < 0.01$), having ever received care at a psychiatric hospital (OR: 1.79, 95% CI: [1.12, 2.85], $p < 0.05$), ever witnessing a family member OD on drugs (OR: 1.59, 95% CI: [1.02, 2.50], $p < 0.05$), being prescribed tranquilizers (OR: 2.07, 95% CI: [1.29, 4.27], $p < 0.01$), ever snorting or sniffing opioids (OR: 2.51, 95% CI: [1.48, 4.27], $p < 0.001$), injecting tranquilizers (OR: 3.09, 95% CI: [1.61, 5.93], $p < 0.001$), and past 90-day injection drug use (OR: 1.68, 95% CI: [1.03, 2.74], $p < 0.05$). Participants who reported past 90-day stimulant misuse had lower odds of reporting OD compared to those who were not recent stimulant users (OR: 0.60, 95% CI: [0.38–0.96], $p < 0.05$).

Conclusions: This study documents the high prevalence of experiencing non-fatal overdose among young nonmedical users of prescription drugs. Results could inform overdose prevention efforts throughout the U.S.

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1. Introduction

In the U.S., drug-related mortality and morbidity have increased significantly in the past decade, largely due to increases in the number of fatal and non-fatal overdoses (OD) involving nonmedical use of prescription drugs (Center for Disease Control and Prevention (CDC), 2010, 2011). Opioids and tranquilizers are the most commonly reported prescription drugs involved in both fatal and non-fatal ODs (Paulozzi and Xi, 2008; Xiang et al., 2012). Although most fatal ODs are observed among people over 35 years old (Bohnert et al., 2010), young adults aged 18–25 exhibit the highest rate of prescription drug misuse (Substance Abuse and Mental Health Service Administration (SAMHSA), 2010a) and account for

nearly 20% of all emergency department visits for non-fatal poisonings involving prescription drugs (SAMHSA, 2010b).

Few studies have investigated the prevalence and risk factors associated with non-fatal OD among young drug users. Existing studies have focused primarily on heroin injection drug users (IDUs; Bohnert et al., 2011; Sherman et al., 2007; Evans et al., 2012), and thus mainly concentrated on heroin OD (Ochoa et al., 2005) or have generally defined drug overdose without specifying the drugs taken during the OD (Evans et al., 2012; Britton et al., 2010; Hakansson et al., 2008). Nonetheless, one study estimated the lifetime prevalence of non-fatal OD among young IDUs to be approximately 30% and found that risk of OD was associated with being White, homeless, using tranquilizers, and having a prolonged history of injection drug use (Sherman et al., 2007). Studies on older IDUs have described additional risk factors associated with non-fatal OD that include male gender (Bohnert et al., 2010), substance use disorders (Darke et al., 1996; Galea et al., 2006; Kaye and Darke, 2004; Maloney et al., 2009), history of drug treatment (Neale and Robertson, 2005; Darke et al., 2004), history of incarceration

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(Kinner et al., 2012; Britton et al., 2010; Havens et al., 2011; Wines et al., 2007), psychological distress (Tobin and Latkin, 2003; Havens et al., 2011; Bohnert et al., 2012; Latkin et al., 2004; Maloney et al., 2009), parental drug problems (Hakansson et al., 2008), injection of prescription opioids (Havens et al., 2011), and concurrent use of heroin and prescription drugs (Kerr et al., 2007).

Several studies have documented non-fatal OD among non-IDUs (Darke et al., 2004; Darke and Ross, 2000; Swift et al., 1999; Carpenter et al., 1998). While none have focused on young adults, these studies have estimated the prevalence of non-fatal OD to be between 3.5% and 13% among non-IDUs (Brugal et al., 2002; Darke et al., 2004), and found that prescription drug misuse, frequency of heroin use, and non-oral heroin administration were significant predictors of OD (Darke et al., 2004; Darke and Ross, 2000; Swift et al., 1999; Carpenter et al., 1998; Brugal et al., 2002).

Overall, there is consensus in the literature that nonmedical use of prescription drugs, along with other behavioral (e.g., heroin use or non-oral drug administration) and contextual factors (e.g., use of drugs following a period of abstinence due to incarceration or drug treatment) are associated with an increased risk of non-fatal OD among various samples of drug users. However, most studies on OD have not developed models to quantify the independent effects of different modes of prescription drug administration (e.g., inhalation vs. injection), particularly among young drug users. For instance, injection of prescription opioids has been associated with non-fatal OD in some studies (Havens et al., 2011), while non-injection opioid use is associated in others (Kerr et al., 2007). Moreover, several studies have reported tranquilizer use as a significant predictor of OD (Kinner et al., 2012; Hakansson et al., 2008; McGregor et al., 1998; Charlson et al., 2009; Gossop et al., 2002), but none have examined whether this association is related to mode of drug administration.

Given these gaps in the literature, this study explores risk factors associated with non-fatal OD resulting from nonmedical use of prescription opioids and/or tranquilizers among a diverse sample of high-risk young adults. In this study, we sought to investigate two general questions: (1) What is the prevalence of non-fatal OD involving prescription opioids and/or tranquilizers among a sample of young nonmedical users of prescription drugs? (2) What socio-demographic and behavioral characteristics are associated with non-fatal overdose on these substances?

2. Methods

2.1. Study sample

The analysis is based upon a sample of 596 young nonmedical users of prescription drugs interviewed in Los Angeles and New York between October 2009 and March 2011. Participants were between 16 and 25 years old and had engaged in misuse of a prescription drug, i.e., opioid, tranquilizer, stimulant, or any combination, at least three times in the past 90 days. "Misuse" or "nonmedical use" was defined and assessed as having used a prescription drug "when it was not prescribed for you or that you took only for the experience or feeling it caused" (SAMHSA, 2010a). Those who reported misuse of at least one of these medications, at least three times in the past 90 days, were eligible to participate in the study.

Sampling was stratified to enroll three groups of young adults with different risk profiles and access to prescription drugs. The first group was comprised of housed, non-IDU participants: who were neither homeless nor IDUs in the preceding 90 days ($n = 202$). The second group was comprised of homeless, non-IDUs participants: who described having inconsistent housing and/or sleeping on the street, in a park, or squat within the past 90 days, but had

not injected drugs in the past 90 days ($n = 192$). The third group was comprised of IDUs, defined as having injected any drug within the past 90 days ($n = 202$). Many IDUs met the criteria for homelessness but were enrolled into the study as 'IDUs' based on their recent injection practices. Since many IDUs were also homeless, the total number of currently homeless young adults was 355.

Participants were located using a combination of sampling strategies and data sources. Interviewers employed both targeted (Watters and Biernacki, 1998) and chain-referral sampling (Biernacki and Waldorf, 1981) in combination with recruitment data from earlier project phases (Lankenau et al., 2012a) to recruit young adults in natural settings such as parks, streets, and neighborhoods. In New York, some participants were recruited from organizations serving homeless youth because homeless individuals meeting the enrollment criteria were more difficult to locate in natural settings. A brief screening tool was used to determine eligibility, and screened individuals received a \$3 gift card. Those consenting to participate were enrolled in the study and compensated \$25 for their time. The study was approved by the Institutional Review Boards (IRB) at Drexel University, Children's Hospital Los Angeles, and National Development and Research Institutes, Inc.

2.2. Measures

Data from the current study were gathered from a cross-sectional survey developed with Entryware Software (Technos Systems, Inc., Vancouver, Canada) and loaded onto laptop computers. The instrument was administered during face-to-face interviews with enrolled participants by one of two interviewers at each recruitment site. Interviews were conducted in private offices or natural settings, such as fast food restaurants and parks. The instrument incorporated questions from standardized measures, previous studies (Lankenau et al., 2007), and topics that emerged during the formative qualitative phase of the study (Lankenau et al., 2012a). Participants were provided with written cards containing response options to facilitate standardization on some interview questions. Demographic indicators, such as age, gender, and race were assessed using conventional questions. Interview data were recorded on laptop computers and digital recorders.

The primary outcome of interest in this analysis was non-fatal OD resulting from nonmedical use of prescription opioids and/or tranquilizers. Opioids included opioid analgesics. Tranquilizers included benzodiazepines, as well as three related medications: Quaalude (Methaqualone), Catapres (Clonidine) and Seroquel (Quetiapine). Participants were asked, "Have you ever experienced an overdose from taking medications [opioids, tranquilizers] when they were not prescribed for you or only for the experience or feeling it caused?" A dichotomous variable was created to capture participants who answered "yes" to having overdosed on either, or both, of these prescription drugs (OD history = 1, no OD history = 0). Participants were also asked how long it had been since their last experienced OD. A simple descriptive analysis revealed that most ODs occurred more than 12 months prior to the time of interview. Therefore, this analysis is focused on lifetime non-fatal OD.

Predictor variables were selected based on previous literature identifying risk factors associated with non-fatal and fatal drug OD and other factors generally indicating inappropriate use of controlled medications, such as non-oral drug administration. Explanatory variables in this analysis included age, sex at birth (female = 0, male = 1), race (nonwhite = 0, white = 1), sexual identity (lesbian/gay/bisexual/transgender = 0, heterosexual = 1), high school completion (no = 0, yes = 1), and social class while growing up (middle/upper = 0, poor/lower class = 1). To account for the

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