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Risk factors for concurrent use of benzodiazepines and opioids among individuals under community corrections supervision

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ABSTRACT

Background: The use of heroin and prescription opioids has increased over the past decade. The concurrent use of opioids with other depressants such as benzodiazepines increases the risk of overdose death compared with use of either drug alone. This study examined factors associated with concurrent use of opioids and benzodiazepines in a criminal justice sample in the state of Alabama.
Methods: The Addiction Severity Index (ASI) and urine drug screen results from 28,570 individuals who were under community corrections supervision from 2002–2012 were examined for independent or concurrent opioid and benzodiazepine use. Multinomial logistic regression analyses were conducted to determine associations between socio-demographic characteristics and drug use.
Results: Concurrent use was detected in 11.5% of the sample. Concurrent use of opioids and benzodiazepines or use of either drug alone was associated with being White, female, married, prescribed psychiatric medications, having seen a physician in the past two years, cannabis use, and having a drug-related offense. Concurrent users were more likely to be unemployed or disabled and have received counseling, and less likely to have completed college, live with relatives or friends, have a history of hallucinations, or have an offense against a person relative to nonusers.
Discussion: While significant overlap of risk factors exists between individuals with concurrent use versus sole use of opioids or benzodiazepines, individuals with concurrent use generally have more social dysfunction than individuals who tested for either substance alone. Concurrent users may need more psychosocial resources and intensive treatments to promote recovery.
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1. Introduction

The United States (US) consumes the most opioid pain medication compared to any nation and misuse of prescription opioids has grown to epidemic proportions (International Narcotics Control Board, 2010). Similarly, the use of heroin and overdose deaths from heroin has tripled since 2010, although twice as many people still die from prescription opioid overdose than heroin (CDC WONDER, 2014). The use of opioids with other central nervous system depressants such as benzodiazepines has been associated with an increasingly large number of these opioid overdose deaths (CDC WONDER, 2014; Gudin et al., 2013; SAMHSA, 2013). Concurrent use of benzodiazepines with opioid replacement therapy such as buprenorphine or methadone can be as high as 70%, (e.g., Nielsen et al., 2007) and concurrent use was implicated in approximately 48% of all opioid-related deaths in West Virginia (Hall et al., 2008). In the US, 43,982 people died in 2013 from an opioid-related overdose (Chen et al., 2015).

The concurrent use of opioids and benzodiazepines appears to be growing, in part, due to the large number of prescriptions written in the US for these medications as well as the increasing availability of heroin (CDC, 2014). A recent Morbidity and Mortality Weekly Report indicated overall high rates of opioid and benzodiazepine prescriptions in the US: 82.5 and 37.6 per 100 residents, respectively, in 2012 (CDC, 2014). The rates of prescriptions for opioids and benzodiazepines was the highest in the Southern US, with 93.7 and 43.1 per 100 residents for opioids and benzodiazepines, respectively, while the Western US had the lowest rates, at 68.0 and 27.9 per 100 residents, respectively (CDC, 2014). Among all the states in the US, Alabama had the highest rate of opioid prescriptions (142.9

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per 100 residents) and the second highest rates of benzodiazepine prescriptions (61.9 per 100 residents; CDC, 2014).

While misuse of these medications can occur at any time, release from jail or prison to community supervision has been shown to be a period of heightened risk for opioid use and overdose deaths among individuals with a history of substance use (Binswanger et al., 2007, 2013). Although these studies have documented the problem of opioid use in the criminal justice population, few studies have directly examined the factors associated with concurrent use of opioids and benzodiazepines following release from prison or jail and return to the community.

Previous studies involving non-criminal justice populations found concurrent opioid and benzodiazepine use to be associated with the following characteristics: younger age, Non-Hispanic White race, female gender, unemployment, anxiety and depressive symptoms, misuse of alcohol during the past year, other prescription drug misuse, cigarette smoking, use of other illicit drugs, and younger age of initiating substance use (Becker et al., 2008; Campbell et al., 2010; Paulozzi, 2012). Little is known whether these same factors are associated with use among a criminal justice sample supervised in the community. Understanding factors associated with concurrent opioid and benzodiazepine use in this high-risk population is important as individuals under community corrections supervision are at heightened risk for overdose in the community (Binswanger et al., 2007). This high risk of overdose persists even though these individuals receive mandatory random drug testing as part of community supervision that carries the risk of sanctions, including jail or prison time, for use of illicit drugs. As such, individuals who continue using illicit substances, despite the threat of re-incarceration or other sanctions, may represent a group of individuals who have different or additional risk factors than those that are already known. Thus, the purpose of this study was to determine the risk factors associated with concurrent use of benzodiazepines and opioids and use of either substance alone compared to no use of these substances while under community corrections supervision.

2. Materials and methods

2.1. Sample

Participants ($N = 28{,}570$) were individuals with a felony charge who were enrolled in Treatment Alternatives for Safer Communities (TASC; see http://www.nationaltasc.org), a criminal diversion program in Alabama. TASC programs are present in all 50 states with the goal of supervising individuals in the community rather than jail or prison for all or part of their sentence. While most individuals were held in jail or prison prior to entering TASC, some had been released on bond before entering the program although data was not available to identify who had come from jail or prison and who had been out on bond prior to TASC supervision. As part of their community corrections supervision, individuals may be mandated to participate in drug or mental health treatment as well as attend other classes (e.g., anger management) and also comply with the rules and regulations indicated on their condition of release. As part of the TASC program, individuals were required to be abstinent from all alcohol and drug use; provide random, non-scheduled, observed urine drug screens; and regularly meet with their case managers.

2.2. Measures

The data used in this study was originally collected for administrative purposes and was approved by the University of Alabama at Birmingham Institutional Review Board for longitudinal research and data analysis. This data set was comprised of all individuals enrolled in the TASC program at any point from 10/2002 to 7/2012. The first observation was used for individuals who were enrolled in TASC more than once during the observation period. The data collected in this study included baseline socio-demographic variables obtained through structured interviews by TASC case managers. Case managers held either a Bachelor's or Master's degree and had received training in conducting standardized interviews as a requirement of the community corrections program. Drug or alcohol dependence or abuse was determined by using a semi-structured interview that reviewed the DSM-IV criteria for each substance. Additionally, intake interviews were conducted to assess socio-demographic status, medical histories, criminal history, employment status, and substance use disorders as specified in the *Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition-Text Revision* (DSM-IV-TR).

The Addiction Severity Index (ASI) was administered as part of the baseline interview and psychosocial functioning was assessed seven domains (e.g., demographics, medical status, employment and support, drug and alcohol use, family and social status, legal status, and psychiatric status; McLellan et al., 1992). Offenses were classified into the following broad categories: drug offenses (e.g., unlawful possession of a controlled substance, distribution, paraphernalia, etc.), crimes against a person offenses (e.g., murder, rape, assault, child abuse, robbery, etc.), property offenses (e.g., receipt of stolen property, burglary, shoplifting, etc.), and court offenses (e.g., failure to appear, contempt of court, etc.). The baseline interview lasted approximately one hour.

TASC participants were assigned a color code and called in daily to determine if they had to provide a urine sample that day. Urine drug screen assays (UDS) were collected randomly during time under community supervision and analyzed using the Olympus 640 AU Chemistry Immuno Analyzer. Drugs of abuse that were analyzed included alcohol (detecting ethyl glucuronide metabolites) as well as amphetamines, barbiturates, benzodiazepines, cannabis, cocaine, opioids, and methadone. The Emit® II Plus Opiate Assay was used to detect opioid metabolites. The opioid metabolites detected by this assay included morphine (e.g., hydrocodone, oxycodone, etc.), morphine-3 glucuronide (metabolites of heroin), and codeine. Methadone was detected through a separate assay. Initial UDS were conducted during the TASC intake procedure, which occurred within 48 h of release from jail. Subsequent urine drug screens were collected randomly from the TASC participants throughout the supervision period. Concurrent use of opioids and benzodiazepines or use of either substance alone were the primary dependent variables, defined as a positive UDS for both substances or either substance alone at the time of urine drug screen.

2.3. Analysis

We examined trends in concurrent use, opioid use, and benzodiazepine use across time using descriptive statistics. Descriptive statistics were calculated with all the variables of interest for concurrent opioid and benzodiazepine use, opioid use alone, benzodiazepine use alone and neither opiate use nor benzodiazepine use. A multinomial logistic regression was calculated to examine which characteristics distinguished nonuse of opioids or benzodiazepines (reference group) from opioid use alone, benzodiazepine use alone, or concurrent use. The multivariate analysis was conducted to examine the unique contributions of each predictor to differentiate concurrent users, opioid use and benzodiazepine use in comparison to nonuse of these substances while controlling for the variance accounted for by the other predictors.

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