Prevalence, correlates and patterns of heroin use among young adults in the United States

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HIGHLIGHTS

- From 2011-2013, lifetime, past-year and past-month heroin use in young adults was 18.4, 7.3 and 3.3 per 1000, respectively
- Young adults initiated heroin use at an early age and used other substances along with heroin
- Sniffing heroin was the single most common route of use, but combination of different routes of use was reported
- Use of non-prescribed opioid analgesics, illicit drugs, smoking and being arrested and booked were correlates of heroin use
- Comprehensive programs that target young adult heroin users and address important risk factors for heroin use are needed.

ARTICLE INFO

ABSTRACT

Introduction: The prevalence of heroin use, abuse, and dependence has increased considerably over the past decade. This increase has largely been driven by young adults (18–25 years). This study aims to improve the understanding of heroin use among young adults by determining the prevalence, correlates, patterns and attitude of heroin use among young adults in the US.
Methods: The 2011–2013 National Survey on Drug Use and Health was analyzed. Study population included 55,940 young adults with valid interviews. Self-reported lifetime, past-year and past-month use of heroin were examined. Descriptive statistics and adjusted odds ratios were estimated in accordance with the complex survey design.
Results: Of the respondents, 18.4 per 1000 (95% CI = 16.8–20.0) used heroin at some time in their lives, and 7.3 per 1000 (95% CI = 6.3–8.3) and 3.3 per 1000 (95% CI = 2.6–4.0) used heroin in the past year and past month, respectively. The single most common route of heroin use was by sniffing. Majority of young adults reported using heroin in combination with other substances. Users of non-prescribed opioid pain relievers, cigarette smokers, illicit drug users and those arrested and booked for breaking the law, had higher odds of using heroin during their lifetime, in the past-year and past-month.
Conclusion: Fewer than 2% reported ever using heroin, and 82% of those reported no use in the past month. Majority were polysubstance users and sniffed heroin in combination with other routes of use. Comprehensive programs that target young adult heroin users and address important risk factors for heroin use are needed.

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1. Introduction

The prevalence of heroin use, abuse, and dependence in the US has seen a considerable increase over the past decade (Jones, Logan, Gladden, & Bohm, 2015). Data from the National Survey on Drug Use and Health (NSDUH) show a significant increase in the total number of past-year heroin users in 2013 from 2002 to 2008 (Lipari & Hughes, 2015). In 2013, about 460 people aged 12 or older initiated heroin use each day (Lipari & Hughes, 2015). Furthermore, from 2010 through 2012, there was a doubling in death rate of people aged 12 or older due to heroin overdose (Hedegaard, Chen, & Warner, 2015). In fact, the age-adjusted rate for drug poisoning deaths involving heroin in people aged 12 or older nearly quadrupled from 0.7 deaths per 100,000 in 2000 to 2.7 deaths per 100,000 in 2013 (Hedegaard et al., 2015).

The significant increase in heroin use in the US has been driven mostly by the population of young adults (18 to 25 years). Data from the NSDUH indicate that the rate of heroin initiation in young adults

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was approximately two to seven times higher than the initiation rates in adolescents (12 to 17 years) and older adults (26 to 49 years), from 2002 to 2011 (Muhuri, Gfroerer, & MC, 2013). Additionally, in 2013, young adults (18 to 25 years) in the US had the highest prevalence rate of past year heroin use (7.0 per 1000) compared to adolescents (12 to 17 years) and older adults (≥26 years) with prevalence rates of 1.0 and 2.0 per 1000, respectively (Lipari & Hughes, 2015). A comparison of the prevalence rates of past-year heroin use between 2002 to 2004 and 2011 to 2013 among adolescents (12 to 17 years), young adults (18 to 25 years) and older adults (≥26 years) revealed that young adults experienced the greatest increase in rates [108.6% (i.e., 3.5 to 7.3 per 1000)] compared to adolescents [−11.1% (i.e., 1.8 to 1.6 per 1000)] and older adults [58.3% (i.e., 1.2 to 1.9 per 1000)] (Jones et al., 2015). Moreover, from 2000 through 2013, young adults had the highest increase in the rate of drug-poisoning deaths involving heroin (Hedegaard et al., 2015). Rates increased 4.9-fold from 0.8 to 3.9 per 100,000 for young adults, and for older adults (25 to 44 years), the rate increased 4.2-fold from 1.3 to 5.4 per 100,000. Likewise, for those aged 45 to 64 years, rates increased 3.8-fold from 0.8 to 3.0 per 100,000.

Despite the burden of heroin use in the population of young adults, there is a paucity in research examining correlates and patterns of heroin use in this population. A substantial body of literature has examined heroin use, abuse and dependence in the general population and have reported correlates of heroin abuse and dependence such as residence in large urban areas, annual household income of less than $20,000, having no health insurance or having Medicaid, and past-year abuse or dependence on alcohol, marijuana, cocaine, or opioid pain relievers (Jones et al., 2015). However, there is evidence to suggest that among young adults, the decision to use a drug is based on a rational appraisal process, rather than a passive reaction to the context in which a substance is available (Boys et al., 2000; Boys, Marsden, & Strang, 2001). Correlates of heroin use among young adults may therefore differ from the general population. Furthermore, many of the studies which examined heroin use among young adults have been limited to subsamples of the US population and as such, cannot be nationally generalized. Pugatch, et al. examined heroin use among young adult heroin users in detoxification facilities in Rhode Island (Pugatch, Strong, Has, et al., 2001). Due to restriction of the study sample to heroin users in treatment facilities in the state, findings from the study cannot be generalized to young adult heroin users in the US. Similarly, Perry and Duroy, in an exploratory study examined differences between adolescent and young adult heroin users and their non-heroin-using peers in a long-term, step-down therapeutic community (Perry & Duroy, 2004). Findings from this study were also limited by the inability to generalize them to US adolescents and young adults. Thus, examining the correlates, patterns and attitudes of heroin use among a nationally-representative sample of young adults is warranted. Improving the understanding of heroin use, abuse, and dependence in the population of young adults by identifying correlates, patterns and attitudes of heroin use can help tailor prevention and treatment efforts in the population of young adults. This study aims to (1) determine the lifetime, past-year and past-month prevalence of heroin use among young adults in the US from 2011 to 2013, (2) describe patterns and attitudes towards heroin use among US young adults, and (3) identify correlates of lifetime, past-year and past-month heroin use among young adults in the US.

2. Material and methods

2.1. Data source and study participants

This study combined data from the 2011 to 2013 National Survey of Drug Use and Health (United States Department of Health and Human Services, 2011, 2012, 2013). The NSDUH is an annual survey sponsored by the Substance Abuse and Mental Health Services Administration (SAMHSA) to measure prevalence and correlates of drug use among

members of the noninstitutionalized US civilian population aged 12 or older. It utilizes a multistage, stratified sampling design to collect data from a nationally-representative sample of people residing in the US. The NSDUH employs a computer-assisted personal interviewing and audio self-interviewing methodology to collect data. Data were weighted to account for sampling design, nonresponse, and noncoverage. The weighted interview response rates for 2011, 2012 and 2013 were 74.4%, 73.0% and 71.7%, respectively. Missing data arising from item nonresponse in the NSDUH data were imputed using the predictive mean neighborhood method. A detailed description of the NSDUH sampling and survey methodology is available elsewhere (Center for Behavioral Health Statistics and Quality, 2013). The current analysis included valid interviews with 55,940 respondents aged 18 to 25 years.

2.2. Measures

2.2.1. Heroin use

Heroin use was assessed using responses to questions on lifetime, past-year and past-month use. For lifetime heroin use, participants were asked, "Have you ever, even once, used heroin?" Participants who answered "Yes" to the question were categorized as having used heroin in their lifetime and those who answered "No" were classified as not having used heroin in their lifetime. Past-year and past-month heroin use were also measured as dichotomous variables (yes or no) using questions on the survey. Past-year heroin use was defined as use of heroin within the 12 months prior to the survey and past-month heroin use, as use of heroin within the 30 days preceding the survey.

2.2.2. Sociodemographic factors

Sociodemographic variables included in the analysis include gender (male or female); race/ethnicity (non-Hispanic (NH) White, NH Black, Hispanic, and NH other); education (less than high school, high school, or college and more); current enrolment in school (yes or no); marital status (married, widowed, divorced or separated, and never married) and health insurance status [private, public (Medicaid, Medicare, TRICARE, CHAMPUS, CHAMPVA, the Veterans Affairs, or military health insurance) or uninsured] (Ko, Farr, Tong, Creanga, & Callaghan, 2015). Other sociodemographic factors include household income (less than $20,000, $20,000 to $49,999, and $50,000 and above); employment status (full-time, part-time, unemployed, or other [disabled, keeping house full time, in school/training, or retired]) and geographic residence (large-, small- or non-metropolitan county areas).

2.2.3. Other substance use, risky sexual behavior and other factors

Alcohol use and cigarette smoking in the past year were both defined as dichotomous variables (yes or no) based on respondent's use in the past year. Use of marijuana, illicit substances (cocaine, hallucinogens and stimulants) and non-prescribed opioid pain relievers in the past year were also categorized as dichotomous variables (yes or no) based on participant's use. Lifetime episode of major depressive disorder (yes or no), arrest and booking for breaking the law (yes or no), involvement in religious activities in the past year (yes or no), and participant's report of sexually transmitted disease in the past year (yes or no) were also examined.

2.2.4. Pattern and attitudes towards heroin use

Participants were asked about the age at which they initiated heroin use. Heroin abuse and/or dependence in the past year was assessed based on criteria listed in the Diagnostic and Statistical Manual of Mental Disorders, fourth Edition (DSM-IV) (American Psychiatric Association, 1994) and was defined as a dichotomous variable (yes or no). Furthermore, routes of heroin use (smoked only, sniffed only, injected only, smoked and sniffed, sniffed and injected, smoked and injected, smoked, sniffed and injected, and other (e.g. orally), as well as concurrent heroin use with alcohol, cigarette, marijuana, non-