



THE USE AND MISUSE OF PRESCRIPTION DRUGS

A Literature Review

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INTRODUCTION

The problem of prescription drug abuse and its related health consequences is a significant and growing public health concern in the United States. (U.S. Department of Health and Human Services, 2013) Overdose deaths involving prescription opioids have quadrupled since 1999, (CDC, 2016) as have sales of these prescription drugs (Frenk et al., 2015). From 1999 to 2015, more than 183,000 people died in the U.S. from overdoses related to prescription opioids (Rudd et al., 2016). Morbidity associated with wider prescription drug abuse has also increased, and rates of prescription drug abuse-related emergency department visits and treatment admissions have risen sharply in recent years (SAMHSA, 2013). **This epidemic of prescription drug abuse and overdose is complex and multi-faceted, incorporates multiple drivers, and involves prevalence rates, motivations, and types of health outcomes that vary by background and demographic factors.**

Examining the increasing rate and character of prescription drug overdose deaths, the Centers for Disease Control and Prevention (2012) indicated that prevention efforts must target users receiving high doses, people soliciting drugs from multiple doctors, and users involved in drug diversion. **Responding to the growing problem of opioid and other prescription drug overdoses necessitates implementing public health strategies that bring together multiple stakeholders at many levels to improve prescribing practices, strengthen legislation and law enforcement, and prevent “doctor shopping.”** Research by Boyd et al. (2006) determined that adolescents' motivations for engaging in illicit use of prescription medications varied by drug classification, yet were often consistent with therapeutic indications for each. For opioid analgesics, an increase in the number of motives increased the risk of substance abuse/dependency problems, and several motivations for nonmedical use appeared associated with a greater likelihood of substance abuse problems.

Surveying trends in college students' medical use, nonmedical use, and diversion of prescription medications, McCabe et al. (2014) found that changes in the medical use of prescription medications paralleled changes in their diversion and nonmedical use. Stimulant medical use, diversion, and nonmedical use significantly grew while the same behaviors with opioids decreased. Additionally, certain demographic traits significantly increased the odds of past-year nonmedical use. In a related study of prescription stimulant use, Teter et al. (2006) reported college students illicitly used prescription stimulants at varying prevalence rates, with eclectic motives and numerous routes of administration. However, the illicit use of amphetamine-dextroamphetamine was significantly more prevalent than illicit use of methylphenidate formulations. Lastly, Birnbaum et al. (2011) concluded that the costs of prescription opioid abuse represent a substantial and growing economic burden for society, with the increasing prevalence of abuse suggesting an even greater societal burden in the future. **In short, prescription drug use and misuse has become a significant issue that demands a range of evidence-based strategies in order to address the negative consequences on individual users, institutions, and on society at large.**

REFERENCES

United States Department of Health and Human Services, Behavioral Health Coordinating Committee, 2013. “Addressing Prescription Drug Abuse in the United States” Available at:

https://www.cdc.gov/drugoverdose/pdf/hhs_prescription_drug_abuse_report_09.2013.pdf

CDC. “Wide-ranging online data for epidemiologic research” (WONDER). Atlanta, GA: CDC, National Center for Health Statistics; 2016. Available at: <http://wonder.cdc.gov>.

Frenk SM, Porter KS, Paulozzi LJ. "Prescription opioid analgesic use among adults: United States, 1999–2012" NCHS data brief, no 189. Hyattsville, MD: National Center for Health Statistics. 2015. Available at:

<https://www.cdc.gov/nchs/data/databriefs/db189.pdf>

Rudd RA, Seth P, David F, Scholl L. "Increases in Drug and Opioid-Involved Overdose Deaths — United States, 2010–2015" MMWR Morb Mortal Wkly Rep. ePub: 16 December 2016. Available at:

<https://www.cdc.gov/mmwr/volumes/65/wr/mm655051e1.htm>

Substance Abuse and Mental Health Services Administration (SAMHSA), Center for Behavioral Health Statistics and Quality. "The DAWN Report: Highlights of the 2011 Drug Abuse Warning Network (DAWN) Findings on Drug-Related Emergency Department Visits" Rockville, MD; 2013. Available at:

<https://www.samhsa.gov/data/sites/default/files/DAWN127/DAWN127/sr127-DAWN-highlights.htm>

ARTICLE 1 CDC GRAND ROUNDS: PRESCRIPTION DRUG OVERDOSES — A U.S. EPIDEMIC

SUMMARY

With nearly 27,000 unintentional drug overdose deaths occurring in 2007—one death every 19 minutes—prescription drug abuse is the fastest growing drug problem in the United States, largely driven by prescription opioid analgesics and the increased rate of their prescription over the last decade. People 20-64 years old, non-Hispanic whites, poor and rural populations, and persons with mental illness have the highest rates of opioid analgesic misuse and overdose death. The two main groups at risk for prescription drug overdose are the roughly 5 million people who report nonmedical use of opioids in the past month, and the roughly 9 million persons who report long-term medical use of opioids. Of the greatest concern are the 10 percent of patients who are prescribed high daily doses, seek care from multiple doctors—accounting for 40 percent of opioid overdoses—and who likely divert drugs to the 76 percent of nonmedical users who report getting drugs prescribed to someone else (p. 1-2).

Current data suggest that the prevention of opioid overdose deaths must "focus on strategies that target 1) high-dosage medical users, and 2) persons who seek care from multiple doctors, receive high doses, and likely are involved in drug diversion" (p. 2). **Promising strategies for influencing these two high-risk groups are reducing the inappropriate use of opioids and preventing "doctor shopping" by using prescription data combined with insurance restrictions; improving legislation and enforcement of existing laws; and improving medical practice in opioid prescription through evidence-based guidelines that can better inform prescribers of the often exaggerated benefits of high-dose opioid therapy and its risks.** A public health approach to prescription drug overdose should also involve tertiary prevention measures to improve long-term and emergency treatment—such as overdose harm reduction programs that prioritize broader distribution of the opioid antidote naloxone, increasing the ability of professionals to administer optimum treatment for overdoses in emergencies—and continuing efforts to remove obstacles to shifting programs from methadone clinics to buprenorphine usage in office-based care (p. 2-3).

In April 2011, the Obama Administration released its national strategy for addressing prescription drug abuse through four components: education, tracking and monitoring, proper medication disposal, and enforcement. When formulating a national approach to address prescription drug overdose, any policy must balance the dual

needs of minimizing abuse while ensuring legitimate access to these medications. Further identifying and defining high-risk populations is also essential for developing and implementing effective interventions. Implementing strategies that target persons at the greatest risk requires “strong coordination and collaboration at the federal, state, local, and tribal levels, as well as engagement of parents, youth influencers, healthcare professionals, and policy-makers” (p.1-4).

REFERENCES

Centers for Disease Control and Prevention (CDC). (2012). CDC Grand Rounds: Prescription Drug Overdoses: a US Epidemic. *MMWR. Morbidity and Mortality Weekly Report*, 61(1), 10.

ARTICLE 2 TRENDS IN MEDICAL USE, DIVERSION, AND NONMEDICAL USE OF PRESCRIPTION MEDICATIONS AMONG COLLEGE STUDENTS FROM 2003 TO 2013: CONNECTING THE DOTS

SUMMARY

The present study demonstrated that trends in the medical use of prescription medications paralleled changes in the diversion and nonmedical use of the same medication class among U.S. college students between 2003 and 2013. The percentage of college students who reported using prescription stimulants in the past year grew significantly, although the number of students who reported using prescription opioids decreased. **Approximately 1 in 5 students reported nonmedical use of at least one controlled medication class in their lifetime (p. 1-4).**

With an overall decrease from 2003-2009, followed by an increase from 2009-2013, the study found evidence of a non-linear trend in the estimated lifetime prevalence of nonmedical use of prescription medications. Additionally, there were no significant year-to-year changes in the past-year prevalence of nonmedical use of prescription stimulants or opioids, suggesting a general rise in nonmedical stimulant use and a general fall in nonmedical opioid use over time rather than any one major change. The prevalence of lifetime and past-year nonmedical use of prescription anxiety/sedative and sleeping medication from 2003 to 2013 appeared to be stable. Women, Asians, and African-Americans had lower odds of nonmedical use across study years and medication classes. **In contrast, Whites, men, students with a lifetime history of medical use of a given class, social fraternity/sorority membership, and being approached to divert medication in the past year significantly increased the odds of past-year nonmedical use (p. 4-7).**

Recent changes in the medical use of prescription medications mirror similar changes in their diversion and nonmedical use among college students. Medical use, diversion, and nonmedical use of prescription stimulants significantly increased while the same behaviors involving prescription opioids decreased. Certain demographic and background characteristics significantly raised the chances of engaging in past-year nonmedical use. **These findings represent an important college health consideration with implications for clinicians, policymakers, and prevention and intervention strategies.** As most adolescents become fully responsible for their own medication management in college, they are presented with more opportunities for substance abuse. Institutions of higher education must endeavor to “balance the medical necessity of these medications and the risk for nonmedical use and diversion” (p. 9).

REFERENCES

McCabe, S. E., West, B. T., Teter, C. J., & Boyd, C. J. (2014). Trends in Medical Use, Diversion, and Nonmedical Use of Prescription Medications Among College Students from 2003 to 2013: Connecting the Dots. *Addictive Behaviors, 39*(7), 1176-1182.

ARTICLE 3 ADOLESCENTS' MOTIVATIONS TO ABUSE PRESCRIPTION MEDICATIONS

SUMMARY

Previous research from the National Survey on Drug Use and Health found that in 2004, roughly 9 percent of U.S. youth aged 12 to 17 reported nonmedical use of prescription medications, with 7 percent reporting the nonmedical use of opioid analgesics (e.g., fentanyl, hydrocodone such as Vicodin, and morphine). However, the present 2005 study of 1,086 7th- through 12th-grade students in an ethnically diverse public school district in the Detroit, Michigan, metropolitan area found the prevalence to be significantly higher, with 14 percent of respondents reporting nonmedical use of prescription medication and 12 percent of respondents having engaged in nonmedical use of opioid pain medication in the past year: 3 percent for sleeping, 2 percent as a sedative and/or for anxiety, and 2 percent as stimulants (p. 1-6).

Motivations for nonmedical use of prescription medications varied by drug classification, with motives often consistent with therapeutic indications for each respective medication class, e.g. 75 percent of students nonmedically using sleeping medication did so exclusively for sleeping. Motivations for nonmedical use of pain medication were more diverse, involving pain relief as well as other motives. Greater variation in motives was also found for stimulants, whose use was most frequently motivated by getting high, help concentrating, and increased alertness. Sedatives/anxiolytics were largely used to help with sleep, decrease anxiety, and get high. **Thus, many respondents admitted to self-treating their pain, sleep, and anxiety problems—though with stimulants they were just as likely to endorse getting high and experimentation as they were use consistent with therapeutic indications.** For opioid analgesics, as the number of motives increased, so did the likelihood of a positive Drug Abuse Screening Test score (DAST-10) and concurrent risk for substance abuse/dependency problems. For every additional motive endorsed, the odds of a positive score on the DAST-10 rose by a factor of 1.8. Comparing nonmedical prescription opioid users who self-medicated for pain (self-treatment) versus users who endorsed multiple motivations (at-risk) for nonmedical use, the study found that users in the at-risk group were significantly more likely to have high DAST-10 scores and engage in alcohol and marijuana use (p. 5-6).

The nonmedical use of prescription drugs “signifies an increasing health problem among U.S. youth, and this increase should impart a sense of urgency” (p. 7). **Future research is warranted as motivations for the nonmedical use of prescription medications appear to be associated with a greater likelihood of substance abuse problems, and it is critical to further evaluate which nonmedical prescription drug users are at the greatest risk (p. 6-7).**

REFERENCES

Boyd, C. J., McCabe, S. E., Cranford, J. A., & Young, A. (2006). Adolescents' Motivations to Abuse Prescription Medications. *Pediatrics, 118*(6), 2472-2480.

ARTICLE 4 ILLICIT USE OF SPECIFIC PRESCRIPTION STIMULANTS AMONG COLLEGE STUDENTS: PREVALENCE, MOTIVES, AND ROUTES OF ADMINISTRATION

SUMMARY

This 2005 study exploring the illicit use of prescription stimulants at a large Midwestern university found that of 4,580 undergraduate students surveyed, 382 (8%) respondents had used illicit prescription stimulants in their lifetime, and 269 (6%) had used illicit prescription stimulants in the past year. The majority of lifetime illicit prescription stimulant users began in college (65%). Students who initiated use before college were nearly three times more likely than students who began in college to report illicit use in the past year. While there were no differences in rates of illicit past-year use between men and women, there were significant ethnic-racial differences: Hispanics 9%, Whites 7%, Asians 3%, and African-Americans 2% (p. 1-4).

The most commonly reported motives for illicit use of prescription stimulants were help with concentration (65%), help studying (60%), and increased alertness (48%). Less frequent reasons included getting high (31%) and experimenting (30%). Men were significantly more likely than women to report experimenting and counteracting the effects of other drugs as their motives, while women were more likely to report losing weight, helping study, and increased alertness as their reasons for use. Most African-Americans reported illicit using to concentrate and help study, and were significantly less likely to report getting high or experimenting versus other racial groups.

Students who began illicit use during college were more likely to report increased concentration and help studying as their motives, while precollege users were more likely motivated by getting high and experimenting.

95 percent of respondents reported oral administration of prescription stimulants, 38 percent reported use by snorting, and 6 percent reporting smoking these agents. Neither sex nor race-ethnicity were significantly associated with any particular route of administration. However, students with precollege onset of use were more likely to report administration by snorting (54%) and/or smoking (12%) (p. 4-8).

Notably, amphetamine-dextroamphetamine (e.g., Adderall) was “clearly the most prevalent stimulant drug used illicitly by college students, at rates 3 times higher than that of methylphenidate formulations” (p. 9). Seventy-six percent of illicit prescription stimulant users reported taking amphetamine-dextroamphetamine in the past year; however, only 25 percent reported using methylphenidate products (e.g., Ritalin, Concerta). **College students, especially women and those entering college, are illicitly using prescription stimulants for a variety of reasons, with academic performance ranking among the top.** High rates of dangerous intranasal use highlight the need for education and prevention efforts. While prescription stimulants are highly effective for treating many conditions, “if they are used without appropriate therapeutic monitoring and management, dangerous health consequences can occur” (p. 9).

REFERENCES

Teter, C. J., McCabe, S. E., LaGrange, K., Cranford, J. A., & Boyd, C. J. (2006). Illicit Use of Specific Prescription Stimulants Among College Students: Prevalence, Motives, and Routes of Administration. *Pharmacotherapy: The Journal of Human Pharmacology and Drug Therapy*, 26(10), 1501-1510.

ARTICLE 5 SOCIETAL COSTS OF PRESCRIPTION OPIOID ABUSE, DEPENDENCE, AND MISUSE IN THE UNITED STATES

SUMMARY

Prescription opioid abuse concerns far more than those persons directly affected by the affliction. **In addition to rising societal healthcare costs, prescription opioid abuse “is associated with a myriad of societal problems related to productivity losses and increasing criminal and legal justice costs that are rapidly becoming a major public health and economic concern” (p. 665).** This study estimated the total societal costs of prescription opioid abuse in the U.S. in 2007 were \$56 billion, involving \$26 billion in lost workplace productivity, \$25 billion in healthcare costs, and \$5 billion in criminal justice costs. These costs create a substantial and growing burden on society that must be addressed in a comprehensive manner (p. 657-661).

The cost of lost earnings from premature death and reduced wages/lost employment drove workplace costs, accounting for \$11 billion and \$8 billion of total societal costs respectively. Excess medical absenteeism, incarceration costs, and disability costs were also factored into these costs. Healthcare costs were the second largest burden, with excess medical and drug costs the main drivers, contributing \$24 billion of total societal costs—95% percent of total healthcare costs. Opioid abuse patients accounted for over 92 percent of excess medical and drug costs. Medicaid, privately insured, and uninsured patients and caregivers each contributed approximately one-third of total excess medical and drug costs. Of the roughly \$5 billion in criminal justice costs—9 percent of total societal costs—the largest share went to correctional facility costs: \$2 billion (44%). Nearly two-thirds of these costs were incurred at the state level. Of total criminal justice costs, \$1.5 billion (30%) went toward police protection, \$726 million (14%) went toward legal and adjudication costs, and \$625 million (12%) were associated with property loss due to crime (p. 658-664).

The costs of prescription opioid abuse, dependence, and misuse amount to a considerable economic burden on society, with the increasing prevalence of abuse indicating an even greater burden in future years. Lowering this burden requires sustained efforts from multiple stakeholders to implement effective interventions. A coordinated, multi-layered response involving healthcare professionals, government, physicians, industry, and academic researchers is essential to make progress on this serious and growing problem (p. 664-665).

REFERENCES

Birnbaum, H. G., White, A. G., Schiller, M., Waldman, T., Cleveland, J. M., & Roland, C. L. (2011). Societal Costs of Prescription Opioid Abuse, Dependence, and Misuse in the United States. *Pain Medicine, 12*(4), 657-667.

CONCLUSION

Prescription drug use and misuse has evolved into a significant national problem, both for individuals and society at large. Deaths from prescription drugs have quadrupled since 1999, with 183,000 people dying between 1999-2015 while sales of prescription drugs have also increased dramatically in that time. As a result of this societal problem, the Centers for Disease Control and Prevention has proposed strategies targeting users with high doses,

those “doctor shopping” (i.e., receiving doses from multiple doctors), and those involved in drug diversion. The severity and complexity of this issue requires buy-in from multiple stakeholders.

This literature review provided a summary of four key recent articles. First, the CDC (2012) recommended a number of prevention strategies, including attempting to “reduce inappropriate use of opioids” and doctor shopping; reducing “pill mills”; improving medical care in prescribing opioids; supporting “harm reduction” programs that provide naloxone in emergency situations; developing guidelines for safe use, including warnings for potentially excessive use. These strategies mirror the National Drug Control Strategy’s four initiatives: education, tracking and monitoring, proper medication disposal, and enforcement.

Second, McCabe et al (2014) found a number of fascinating findings that provide much-needed nuance to the discussion of “prescription drugs,” an umbrella term encompassing a wide variety of drugs. For example, McCabe et al reported that a decline in the nonmedical use of prescription opioids by college students has been counteracted by medical use of prescription stimulants. At the same time, the authors described, the potential for dangers, including death from overdose, is at an all-time high (e.g., overdose deaths from prescription opioids were higher than heroin and cocaine *combined*).

Third, Teter et al (2006) found that certain types of prescription stimulants, e.g., Adderall, were used three times more frequently than others, such as Ritalin. White and Hispanic college students were more likely to use prescription stimulants than other groups (i.e., Asians and Blacks), with motivation to use prescription stimulants being linked to a desire for increased academic performance.

Finally, Birnbaum et al (2011) attempted to determine the societal cost of prescription opioid abuse, proposing that this abuse costs society over \$55 billion, while also noting that their study “likely understates both the health care costs and total societal costs” (p. 665). Consequences of prescription opioid abuse include losses in worker productivity, and criminal and legal costs that lead to significant public health challenges.

AUTHOR INFORMATION

Benjamin Gleason, PhD is the Director of Applied Research for the Prospectus Group. He earned a PhD in Educational Psychology & Educational Technology from Michigan State University, researching how to best support communities of learners through educational technology. Before academia, Benjamin has worked in youth and adult-serving learning spaces for almost fifteen years, from designing youth-initiated community service projects and teaching high school in Richmond, California, to working as a university instructor in Guatemala. Benjamin is also a founder of the Prospectus Group.

Tanner Brooks, MA earned his BA in Political Science from Oberlin College and an MA (with distinction) in International Studies and Diplomacy from the University of London School of Oriental and African Studies, where his thesis focused on examining the application of international human rights norms to the experience of child soldiers in Sierra Leone. He has a decade of experience in national and international activism, advocacy, and education, from working on political campaigns, nonprofits, and political action committees to writing and teaching politics and sociology as a professor in Tunisia. His most recent work involves mentoring and tutoring teenage survivors of sex trafficking.

WORKS CITED

- Birnbaum, H. G., White, A. G., Schiller, M., Waldman, T., Cleveland, J. M., & Roland, C. L. (2011). Societal Costs of Prescription Opioid Abuse, Dependence, and Misuse in the United States. *Pain Medicine, 12*(4), 657-667.
- Boyd, C. J., McCabe, S. E., Cranford, J. A., & Young, A. (2006). Adolescents' Motivations to Abuse Prescription Medications. *Pediatrics, 118*(6), 2472-2480.
- CDC. "Wide-ranging online data for epidemiologic research" (WONDER). Atlanta, GA: CDC, National Center for Health Statistics; 2016. Available at: <http://wonder.cdc.gov>.
- Centers for Disease Control and Prevention (CDC). (2012). CDC Grand Rounds: Prescription Drug Overdoses: a US Epidemic. *MMWR. Morbidity and Mortality Weekly Report, 61*(1), 10.
- Frenk SM, Porter KS, Paulozzi LJ. "Prescription opioid analgesic use among adults: United States, 1999–2012" NCHS data brief, no 189. Hyattsville, MD: National Center for Health Statistics. 2015. Available at: <https://www.cdc.gov/nchs/data/databriefs/db189.pdf>
- McCabe, S. E., West, B. T., Teter, C. J., & Boyd, C. J. (2014). Trends in Medical Use, Diversion, and Nonmedical Use of Prescription Medications Among College Students from 2003 to 2013: Connecting the Dots. *Addictive Behaviors, 39*(7), 1176-1182.
- Rudd RA, Seth P, David F, Scholl L. "Increases in Drug and Opioid-Involved Overdose Deaths — United States, 2010–2015" *MMWR Morb Mortal Wkly Rep.* ePub: 16 December 2016. Available at: <https://www.cdc.gov/mmwr/volumes/65/wr/mm655051e1.htm>
- Substance Abuse and Mental Health Services Administration (SAMHSA), Center for Behavioral Health Statistics and Quality. "The DAWN Report: Highlights of the 2011 Drug Abuse Warning Network (DAWN) Findings on Drug-Related Emergency Department Visits" Rockville, MD; 2013. Available at: <https://www.samhsa.gov/data/sites/default/files/DAWN127/DAWN127/sr127-DAWN-highlights.htm>
- Teter, C. J., McCabe, S. E., LaGrange, K., Cranford, J. A., & Boyd, C. J. (2006). Illicit Use of Specific Prescription Stimulants Among College Students: Prevalence, Motives, and Routes of Administration. *Pharmacotherapy: The Journal of Human Pharmacology and Drug Therapy, 26*(10), 1501-1510.
- United States Department of Health and Human Services, Behavioral Health Coordinating Committee, 2013. "Addressing Prescription Drug Abuse in the United States" Available at: https://www.cdc.gov/drugoverdose/pdf/hhs_prescription_drug_abuse_report_09.2013.pdf