Published in final edited form as:

Subst Abuse. 2014 ; 35(3): 284–289. doi:10.1080/08897077.2014.928660.

Psychological and Drug Abuse Symptoms Associated with Non-medical Use of Opioid Analgesics among Adolescents

Carol J Boyd, MSN, PhD^{1,2,3,*}, Amy Young, PhD³, and Sean E McCabe, MSW, PhD³

¹School of Nursing, University of Michigan, Ann Arbor, MI, 48109

²Addiction Research Center, Department of Psychiatry, University of Michigan, Ann Arbor, MI, 48109

³Institute for Research on Women and Gender, University of Michigan, 1136 Lane Hall, 204 S. State Street, Ann Arbor, MI, 48109

Abstract

Background—This exploratory study examined the psychological and substance abuse symptoms and motivations associated with adolescents' medical and nonmedical use of opioid analgesics. We compared three groups of adolescents: 1) those who never used an opioid analgesic; 2) those who used a prescribed opioid analgesic (medical users); and 3) those who used someone else's opioid analgesics (nonmedical users). Nonmedical use was defined as using someone else's opioid analgesic medication. Comparisons among the groups were made on psychological and substance abuse symptoms as well as motivations to engage in nonmedical use.

Methods—A web-based survey, the *Secondary Student Life Survey* (SSLS) was administered to a sample of students who attended one of five secondary schools in southeastern Michigan. The sample included 2,627 respondents and was evenly distributed by sex and grade. Sixty-five percent (65.0%) were White/Caucasian and 29.5% African-American. The average age was 14.8 years (SD=1.9).

Results—Seventy percent (70.4%, n=1850) reported never using opioid analgesics in their lifetimes. Of the remaining 24.5% (n=644) of opioid analgesic users, most were medical users. However, 3.5% (n=92) were classified as nonmedical users who used someone else's medication for pain relief only, and 1.6% (n=41) were classified as nonmedical users for reasons other than for pain relief (e.g. to get high). In contrast to never users, both medical users and nonmedical users reported more substance abuse symptoms and symptoms associated with pain. Further, those nonmedical users who used opioids to sensation seek had greater odds of having psychological symptoms.

Conclusions—These data: 1) provide additional support for the existence of distinct subgroups of adolescent opioid analgesic users; 2) provide evidence of psychological symptoms associated with nonmedical use; and 3) highlight the psychological differences among nonmedical users who self-treat for pain versus nonmedical users who use for other reasons (e.g. experiment or get high).

*Institute for Research on Women and Gender, University of Michigan, 1136 Lane Hall, 204 S. State Street, Ann Arbor, MI, 48109.

Keywords

prescription drug misuse; opioid use; motives; adolescents; substance abuse; problem behaviors

INTRODUCTION

Evidence shows that over the past decades that the prescribing of *controlled* medications to adolescents has substantially increased;¹⁻⁷ and notably, this same period saw increases in the nonmedical use of controlled medications⁸ (defined as using someone else's medication whether self-treating pain or to engage in sensation-seeking).⁹ Twenty-two percent (22%) of first time illicit drug users started with controlled medications (e.g. Vicodin®, OxyContin®, Adderall®), second only to marijuana initiation.¹⁰ The rise in prescription drug abuse appears highly related to the relative ease with which people share their own prescription medications among friends and family.^{11, 12}

There is a growing literature on the correlates of nonmedical use among adolescents, college students and adults,^{8, 13-17} although there are few studies that examine relationships among adolescents' psychological and substance abuse symptoms and nonmedical use¹⁸. One reason for this dearth is that the NSDUH has notably weak measures for many psychological symptoms¹⁸ and their question on nonmedical use is complex and fails to distinguish between medical misusers and nonmedical users.

The purpose of this exploratory study was to build on previous work^{9,11,12} and examine select psychological and substance abuse symptoms associated with adolescents' medical and nonmedical use of opioid analgesics. The research question was: When compared to nonusers, do medical users and nonmedical users of opioid analgesics have higher rates of psychological symptoms as measured by the Youth Self-Report and higher DAST-10 scores? Further, we examined the motivations to engage in nonmedical use (e.g. self-treatment versus sensation-seeking) in the belief that motivations may be associated with psychological symptoms for nonmedical users.

In order to answer the aforementioned question, we compared three mutually exclusive groups of adolescents: 1) those who had never used an opioid analgesic; 2) those who had used an opioid analgesic (medical users); and 3) those who used someone else's opioid analgesic (nonmedical users). Our goal was to examine group differences within two areas: psychological symptomology and substance abuse symptoms. We also sought to determine whether nonmedical users who had taken opioid medications to relieve pain (self-treaters), in contrast to those who used to sensation seek, were more likely to have concomitant psychological symptoms.

METHODS

This exploratory study employed the web-based, school-based, self-administered *Secondary Student Life Survey* (SSLS) that was administered to 2,627 students enrolled in five schools in southeastern Michigan from 2009 to 2010. Approval from the Institutional Review Board of the University of Michigan, a Certificate of Confidentiality, parental consent, and student

assent were obtained prior to any data collection. Sixty-five percent (65.0%) were White/Caucasian, 29.5% were African-American, 3.7% were Asian, 1.3% were Hispanic, and .5% were American Indian/Alaskan Native. The average age was 14.8 (SD=1.9) years and the sample was evenly distributed by sex and grade. Additional information regarding the procedures and sample characteristics is available elsewhere.^{9,11,16,19}

Measures

Opioid analgesic use (lifetime) was based on the following algorithm: 1) adolescents who indicated that they had never used opioid analgesics were assigned to the never user group; 2) adolescents who had used opioid analgesics medically (but not nonmedically) were assigned to the medical user group; 3) adolescents who had used nonmedically to *only* relieve their pain were assigned to the group who used nonmedically to treat pain; and 4) adolescents who had used at least once nonmedically for reasons other than to treat their pain (e.g., “to get high”) were assigned to the nonmedical sensation seeker group. Medical and nonmedical use of other types of controlled medications (i.e., sleep medications, anxiolytic, stimulant,) was measured with a series of single item questions about lifetime use since we wanted to characterize the use of other controlled medications. The ten-item Drug and Alcohol Screening Test (DAST-10) was used to determine current drug abuse symptoms; a score of three or more was a positive indicator.²¹ Current psychological symptoms (i.e., affective, anxiety, somatic, attention-deficit hyperactivity, and conduct) were measured with the *Youth Self Report* (YSR) version of the *Child Behavior Checklist* (CBCL).²² Since we were examining motivations, we also included a five-item index previously used in the *National Youth Survey* (NYS)²³ that asks respondents about their pain symptoms.

Analysis Strategy

A series of multinomial logistic regressions were conducted to determine if the groups differed on psychological and substance abuse symptoms as well as pain symptoms. We also examined group differences relative to motivation to engage in nonmedical use.

RESULTS

Seventy percent (70.4%, n=1850) reported never using opioid analgesics. Of the remaining respondents, 24.5% (n=644) were classified as medical opioid users, (i.e., lifetime medical use but no nonmedical use), 3.5% (n=92) were classified as nonmedical self-treaters, and 1.6% (n=41) were classified as nonmedical sensation seekers.

Table 1 presents data from the multinomial logistic regressions. Medical users, in contrast to nonusers, were more likely to be White, female, and over the age of 15. When controlling for ethnicity, gender, and age, medical users were also more likely to have additional prescriptions for controlled medications (e.g. anxiolytic), to score positively on the DAST-10, and have psychological symptoms (including affective, anxiety, somatic, and conduct disorders).

Medical users, in contrast to nonmedical sensation seekers, were less likely to use prescribed medications for anxiety and depression; less likely to nonmedically use sleep, anxiety, and

stimulant medications; less likely to show symptoms for affective, anxiety, somatic, and conduct disorders; and reported fewer pain symptoms. There were fewer differences between medical users and nonmedical users who used opioids for pain relief.

DISCUSSION

Generally, adolescents who were prescribed opioids or who used nonmedically had more substance abuse and psychological symptoms than youth who had never received a prescription for an opioid analgesic. Gender differences were observed among medical users, revealing that girls with prescriptions for opioid analgesics are at particular risk for these symptoms.

This study adds to a growing literature on subtypes of opioid analgesic users, even when we consider psychological symptoms. While we found few differences between medical users and those who used someone else's (nonmedical users) for pain relief, those opioid users who used for other purposes (e.g. to get high, to experiment) presented with a greater number of psychological and substance abuse symptoms. Nonetheless, all users – whether with their own prescription or someone else's had more psychological and substance abuse symptoms than those who had never been prescribed.

Our findings suggest several things: 1) All adolescents being prescribed opioids should be assessed for substance use, with the recognition that girls may be at slightly higher risk than boys for nonmedical use; 2) While self-treatment with opioid analgesics to treat pain should be strongly sanctioned, self-treaters appear more like medical users than nonmedical users who sensation-seek. This indicates that appropriate pain management should be considered as well as educating youth about the correct use of controlled medications. 3) And finally, the motive behind the use may be more relevant than the means of obtaining the medication when considering adolescents prescription drug abuse.

There are limitations to this investigation: this study relied on self-report and data were collected in school, possibly leading to underestimates. Moreover, our study was conducted in two school districts within Michigan, and a nationally representative study is necessary to determine the generalizability of our findings. Nonetheless, this exploratory study provides new information regarding psychological symptoms associated with several forms of opioid analgesic use. We believe this study offers important insights for clinicians who prescribe opioid analgesics.

Acknowledgments

This study was supported by grants from the National Institute on Drug Abuse, National Institutes of Health: R01DA024678 (PI: C.J. Boyd) and R01DA031160 (PI: S.E. McCabe).

References

1. Fortuna RJ, Robbins BW, Caiola E, Joynt M, Halterman JS. Prescribing of controlled medications to adolescents and young adults in the United States. *Pediatrics*. 2010; 126(6):1108–1116. [PubMed: 21115581]

2. Gilson AM, Ryan KM, Joranson DE, Dahl JL. A reassessment of trends in the medical use and abuse of opioid analgesics and implications for diversion control: 1997-2002. *Journal of Pain and Symptom Management*. 2004; 28(2):176–188. [PubMed: 15276196]
3. Manchikanti L, Singh A. Therapeutic opioids: a ten-year perspective on the complexities and complications of the escalating use, abuse, and nonmedical use of opioids. *Pain Physician*. 2008; 11(2 suppl):S63–S88. [PubMed: 18443641]
4. Thomas CP, Conrad P, Casler R, Goodman E. Trends in the use of psychotropic medications among adolescents, 1994 to 2001. *Psychiatric Services*. 2006; 57(1):63–69. [PubMed: 16399964]
5. Wong IC, Murray ML, Camilleri-Novak D, Stephens P. Increased prescribing trends of paediatric psychotropic medications. *Archives of Disease in Childhood*. 2004; 89(12):1131–1132. [PubMed: 15557050]
6. Zacny J, Bigelow G, Compton P, Foley K, Iguchi M, Sannerud C. College on problems of drug dependence taskforce on prescription opioid non-medical use and abuse: position statement. *Drug and Alcohol Dependence*. 2003; 69(3):215–232. [PubMed: 12633908]
7. Zito JM, Safer DJ, DosReis S, et al. Psychotropic practice patterns for youth: a 10-year perspective. *Archives of Pediatrics & Adolescent Medicine*. 2003; 157(1):17–25. [PubMed: 12517190]
8. Substance Abuse and Mental Health Services Administration. Results from the 2007 National Survey on Drug Use and Health: National Findings. Rockville, MD: Substance Abuse and Mental Health Services Administration, Office of Applied Studies; 2008. NSDUH Series H-34, DHHS publication SMA 08-4343
9. Boyd CJ, Young AM, Grey M, McCabe SE. Adolescents' nonmedical use of prescription medications and other problem behaviors. *Journal of Adolescent Health*. 2009; 45(6):543–550. [PubMed: 19931825]
10. Johnston, LD.; O'Malley, PM.; Bachman, JG.; Schulenberg, JE. Monitoring the Future national survey results on drug use, 1975-2011: Secondary school students. Vol. I. Ann Arbor: Institute for Social Research, The University of Michigan; 2012.
11. Boyd CJ, McCabe SE, Cranford JA, Young AM. Gender differences in prescription drug abuse and diversion among adolescents in a Southeast Michigan school district. *Archives of Pediatrics & Adolescent Medicine*. 2007; 161(3):276–281. [PubMed: 17339509]
12. McCabe SE, West BT, Cranford JA, et al. Medical misuse of controlled medications among adolescents. *Archives of Pediatrics & Adolescent Medicine*. 2011; 165(8):729–735. [PubMed: 21810634]
13. Bohnert AS, Eisenberg A, Whiteside L, Price A, McCabe SE, Ilgen MA. Prescription opioid use among addictions treatment patients: nonmedical use for pain relief vs. other forms of nonmedical use. *Addictive Behaviors*. 2013; 38(3):1776–1781. [PubMed: 23254228]
14. McCabe SE, Cranford JA, Boyd CJ, Teter CJ. Motives, diversion and route of administration associated with nonmedical use of prescription opioids. *Addictive Behaviors*. 2007; 32(3):562–575. [PubMed: 16843611]
15. McCabe SE, Boyd CJ, Cranford JA, Teter CJ. Motives for nonmedical use of prescription opioids among high school seniors in the United States: self-treatment and beyond. *Archives of Pediatrics & Adolescent Medicine*. 2009; 163(8):739–744. [PubMed: 19652106]
16. McCabe SE, West BT, Boyd CJ. Medical use, medical misuse, and nonmedical use of prescription opioids: results from a longitudinal study. *Pain*. 2013; 154(5):708–713. [PubMed: 23433943]
17. Young A, McCabe SE, Cranford JA, Ross-Durow P, Boyd CJ. Nonmedical use of prescription opioids among adolescents: subtypes based on motivation for use. *Journal of Addictive Diseases*. 2012; 31:1–10. [PubMed: 22356663]
18. Schepis TS, Krishnan-Sarin S. Sources of prescriptions for misuse by adolescents: differences in sex, ethnicity, and severity of misuse in a population-based study. *Journal of the American Academy of Child and Adolescent Psychiatry*. 2009; 48(8):828–836. [PubMed: 19564803]
19. McCabe SE, West BT, Teter CJ, Ross-Durow P, Young A, Boyd CJ. Characteristics associated with the diversion of controlled medications among adolescents. *Drug and Alcohol Dependence*. 2011; 118:452–458b. [PubMed: 21665384]
20. Boyd CJ, McCabe SE, Cranford JA, Young AM. Adolescents' motivations to abuse prescription medications. *Pediatrics*. 2006; 118:2472–2480. [PubMed: 17142533]

21. Skinner H. The drug abuse screening test. *Addictive Behaviors*. 1982; 7:363–371.1. [PubMed: 7183189]
22. Achenbach, TM. Integrative Guide for the 1991 CBCL/4-18, YSR, and TRF Profiles. University of Vermont, Department of Psychiatry; Burlington, VT: 1991.
23. Elliott, D. National Youth Survey. Ann Arbor, MI: Inter-university Consortium for Political and Social Research, (distributor). 1987; 2009 Apr 01. ICPSR06542-v3

Table 1

Opioid Groups Based on Multinomial Logistic Regressions.

	a. Never Used (n=1850)		b. Medical Users (n=644)		c. NM Pain Relievers (n=92)		d. NM Sensation Seekers (n=41)	
	%	Group Differences	%	Group Differences	%	Group Differences	%	Group Differences
Demographic Characteristics								
Female	46.7%	b,c	59.8%	a	68.5%	a	61.0%	
White	62.8%	b,d	71.8%	a,c	56.5%	b,d	85.4%	a,c
15 or younger	65.9%	b,c	54.3%	a	51.1%	a	53.7%	
Medical Use of Prescriptions								
Sleep – lifetime use	1.7%	b,c,d	9.8%	a	9.8%	a	22.0%	a
Anxiety – lifetime use	1.9%	b,d	9.0%	a,d	3.3%	b,d	24.4%	a,b,c
Stimulant – lifetime use	4.1%	b	8.7%	a	5.4%	d	22.0%	a,b,c
Anti-depressants – lifetime use	3.5%	b,d	10.2%	a,d	7.7%	d	34.1%	a,b,c
Nonmedical Use of Prescriptions								
Sleep – lifetime use	1.6%	c,d	2.4%	c,d	21.7%	a,b,d	31.7%	a,b,c
Anxiety – lifetime use	.4%	c,d	1.1%	d	3.3%	a,d	31.7%	a,b,c
Stimulant – lifetime use	1.0%	d	1.9%	d	2.2%	d	48.8%	a,b,c
DAST 10 (Drug Problems)	2.0%	b,d	6.0%	a,d	3.3%	d	65.9%	a,b,c
Psychological Symptoms								
YSR – Affective \	5.2%	b,d	9.9%	a,d	8.7%	d	36.6%	a,b,c
YSR – Anxiety	3.0%	b,d	3.9%	a,d	3.3%		14.6%	a,b,c
YSR – Somatic	4.3%	b,c,d	9.3%	a,d	41.2%	a,d	31.7%	a,b,c
YSR – ADHD	2.5%	d	2.6%		2.2%		19.5%	A
YSR - Conduct Disorder	3.4%	b,c,d	4.7%	a,c,d	8.7%	a,b,d	46.3%	a,b,c
Physical Pain Symptoms (10 out of past 30 days)	18.9%	b,c,d	27.2%	a,d	29.3%	a	48.8%	a,b

Note: Gender, ethnicity, and age were included in the equations as control variables for regressions examining medical use of prescriptions, nonmedical use of prescriptions, illicit drugs, behavioral disorders, and physical symptoms.

- ^a Significantly different from nonusers at the $p < .01$ level; based on multinomial logistic regressions with this group as the reference category.
- ^b Significantly different from medical users at the $p < .01$ level; based on multinomial logistic regressions with this group as the reference category.
- ^c Significantly different from nonmedical pain relievers at the $p < .01$ level; based on multinomial logistic regressions with this group as the reference category.
- ^d Significantly different from nonmedical sensation seekers at the $p < .01$ level; based on multinomial logistic regressions with this group as the reference category.