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Risk Profiles among Adolescent Nonmedical Opioid Users in the United States

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Abstract

Although prior research has provided data on nonmedical use of opioids in adolescents, studies examining the heterogeneity of risk are limited. The present study extends prior research by deepening the understanding of adolescent nonmedical opioid use by specifying empirically meaningful profiles of risk. Using data on adolescent non-medical opioid users ($N = 1,783$) from the 2008 US National Survey on Drug Use and Health (NSDUH), latent class analysis and multinomial logistic regression were employed to identify latent classes and determine the effects of covariates on class membership. Four latent classes provided the best fit to the data. Classes consisted of a low risk class (33.7%), a high delinquency/low substance use class (17.8%), a high substance use/low delinquency class (34.2%), and finally a high risk class (14.3%) characterized by high levels of both substance use and delinquent behavior. Study findings advance the understanding of adolescent nonmedical opioid use by specifying distinct latent classes. Results suggest that intervention efforts can fruitfully target a number of risk domains especially programs that enhance effective parenting and supervision.

Keywords

Nonmedical opioid use; prescription drug abuse; adolescent substance abuse; adolescent risk

1. Introduction

Nonmedical opioid use refers to the unauthorized use of prescription analgesic opioids such as oxycodone (Oxycontin®, Percocet®) or hydrocodone (Lortab®, Vicodin®). There has

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been a recent upsurge in the nonmedical use and abuse of prescription analgesic opioids in the United States (Blanco et al., 2007; Compton, & Volkow, 2006; Friedman, 2006; Sung et al., 2005). Consequences stemming from nonmedical use of these substances have resulted in increased rates of mortality and emergency department visits (Gilson et al., 2004; Paulozzi, 2006).

Although numerous correlates have been identified in survey research (Sung et al., 2005; Wu, Pilowsky, & Patkar, 2008), the variation of these risk correlates on different subgroups of adolescent nonmedical opioid users (i.e., heterogeneity) is unknown. The present study goal is to build on prior survey research by specifying (describing and predicting) empirically meaningful profiles of risk using latent class analysis. We hypothesize that multiple domains of risk will predict class membership and that the intensity of these risk factors will be especially salient for adolescent nonmedical opioid users who are high in externalizing (e.g., fighting and stealing), more likely to be male, and have prior contact with the criminal justice system. Thus, we employ available variables across several domains of risk such as socio-demographic, risk propensity, internalizing symptoms (anxiety and depression), familial (involvement and supervision), and prior experiences with prevention programming.

2. Methods

2.1 Data and procedures

This study is based on data from the 2008 National Survey on Drug Use and Health (Substance Abuse and Mental Health Services Administration, Office of Applied Studies, 2009). NSDUH provides population estimates of substance use and health behaviors in the U.S. general population. The NSDUH interview uses a computer-assisted interviewing (CAI), which combines computer-assisted personal interviewing (CAPI) and audio computer-assisted self-interviewing (ACASI) methods. NSDUH design and data collection procedures have been reported in detail elsewhere (Substance Abuse and Mental Health Services Administration, Office of Applied Studies, 2009). The current study restricted analyses to the adolescents aged 12–17 years ($N = 17,842$).

2.2 Measurement

Nonmedical opioid use—Adolescent nonmedical opioid users ($N = 1,783$) were identified based on whether they responded affirmatively to the nonmedical lifetime use of any of the numerous prescription pain relievers mentioned. The sample was predominately female (55.3%). In terms of race/ethnicity, 66% were White, 15.9% Hispanic, 11.9% African-American, and 6.2% other. There was a relatively even distribution across income levels (17.8% < \$20,000, 50.4% between \$20,000–\$74,999, and 31.8% > \$75,000).

Risk variables used to differentiate latent classes—Variables used to differentiate adolescent nonmedical opioid users included self-reported past-year use of alcohol, tobacco, and illicit drugs (use of marijuana, inhalants, hallucinogens, cocaine/crack, or heroin; non-prescription use of prescription stimulants, tranquilizers, or sedatives) and a range of delinquent behaviors. These were also measured dichotomously (i.e., yes or no).

Sociodemographic and mental health covariates—Gender, race/ethnicity (non-Hispanic white, non-Hispanic black, Hispanic, and other [e.g., American Indian or Alaska Native, Asian, other Pacific Islander or Native Hawaiian]), school status (dropout vs. non-dropout), having a father in the home or not, ever jailed or incarcerated, total annual family income (less than \$20,000, \$20,000 to \$49,999, \$50,000 to \$74,999, and \$75,000 or more), metropolitan population density (classified as large, 1 million; small, less than 1 million;

and nonmetropolitan), lifetime history of depression and anxiety based on whether the respondents were told by a doctor or other medical professional if they had either of these disorders, and two risk propensity items were employed.

Parental involvement covariates—Seven items (0 = no, 1 = yes) were used to assess various forms of parental involvement. Each of these items was used as separate covariates to elucidate greater information regarding the specific forms of parental involvement that are important.

Youth experience covariates—Four items (0 = no, 1 = yes) were used to assess experiences that youth had with prevention programming both in and out of school. As with parental involvement covariates, each item was employed as a separate covariate.

2.3 Statistical analysis

Latent class analysis was executed to identify distinct subtypes of respondents. The Bayesian Information Criterion (BIC), Akaike Information Criterion (AIC), log likelihood values, entropy (i.e., class purity), and conceptual meaningfulness of latent classes was used to select the best-fitting model. Next, class membership was predicted based on previously described sociodemographic behavioral, parental involvement and youth experiences covariates using a multinomial regression model. Sampling weights that adjusted for the complex survey sampling design, probability of selection, and nonresponding were incorporated in the analysis. All analyses were conducted using MPlus 5.21 (Muthén & Muthén, 2008).

3. Results

3.1 Identification of latent classes

A total of 1–5 latent classes were tested and the four-class solution was the best fitting model. The final four-class solution (see Figure 1) is comprised of a low risk class (33.7%, $N = 507$), a high delinquency/low substance use class (17.8%, $N = 268$), a high substance use/low delinquency class (34.2%, $N = 514$), and finally a high overall risk class (14.3%, $N = 215$) characterized by high levels of both substance use and delinquent behavior.

3.2 Characteristics and predictors of latent classes

Table 1 displays results from logistic regression analysis examining the effects of covariates on class membership. The low risk class (class 1) is the reference category. With respect to gender, males were approximately three times more likely to be members of the high risk and high substance use/low delinquency class than females. African-Americans were significantly more likely than Whites to be members of the high delinquent/low substance use class but 89% and 42% less likely than Whites to be members of the high risk and high substance use/low delinquency class. Compared to higher income level households, adolescents from households with lower incomes were uniformly more likely to be members of the risk classes.

History of incarceration increased the odds of membership in all three classes. Lifetime anxiety had large effect in predicting membership in the high risk class. Family involvement and supervision had notable effects in reducing the likelihood across risk classes as compared with the low risk group. Adolescents who participated in a violence prevention or drug prevention program showed greater odds of being in the high delinquency/low substance use and high risk classes than the low risk class.

4. Discussion

This study's unique contribution is the specification of the heterogeneity among adolescent non-prescription opioid users in a nationally representative sample. Main findings showed that male gender, history of incarceration, anxiety, low family income levels, and not voicing pride from parents were strongly associated with membership in the high risk class. Approximately one third of youth were classified as low risk in that they demonstrated little involvement in substance use and delinquency. Also representing approximately one-third of adolescent non-prescription opioid users was a high substance use/low delinquency class. Compared to the low risk class, all three risk classes identified were characterized by a spectrum of problem behaviors, albeit it in different forms and levels of severity. The remaining one-third of youth was parsed between a high delinquency/low substance use class and an overall high risk class. All the three risk classes were less likely to have parents involved in their lives compared to the low risk class suggesting the importance of parental monitoring and involvement in lowering substance use. Uniquely, findings also indicate that all three risk classes were more likely to be involved in prevention programming in and outside of school. This is likely a result of encountering mandatory programs based on a prior pattern of externalizing behavior.

As noted by Compton and Volkow (2006), moving forward with more focused treatment and prevention efforts for nonmedical opioid use requires greater refinement of risk among various subgroups. The current study extends the literature by shedding light on these subgroups and identifying potentially risk and protective variables (e.g., specific externalizing behaviors, anxiety, and patterns of family and parental monitoring and supervision) that are predictive of subgroup membership.

Study limitations include the cross-sectional design, reliance of self-report of drug use in the absence of biochemical verification, and a lack of explicit diagnostic assessments of anxiety and depression.

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Highlights

- We model the heterogeneity among adolescent opioid users in the U.S.
- We identified four distinct latent classes across the spectrum of delinquent and substance use behaviors.
- Intervention efforts can fruitfully target risk domains associated with the latent classes.

Figure 1.
Prevalences of 16 Risk Behaviors Across 4 Latent Classes.

Table 1**Multinomial Logistic Regression Results Predicting Latent Class Membership**

	Class 2 (High Del/low SU) OR (95% CI)	Class 3 (High SU/low Del) OR (95%CI)	Class 4 (High Overall Risk) OR (95%CI)
<i>Gender</i>			
Male	1.46 (0.73–2.93)	1.53 (1.17–2.01)	3.23 (1.20–8.70)
<i>Race/ethnicity</i>			
African-American	1.99 (1.38–2.89)	0.58 (0.42–0.80)	0.11 (0.06–0.22)
Hispanic	1.36 (0.49–3.82)	0.40 (0.40–0.41)	0.38 (0.20–0.71)
Other	0.34 (0.08–1.52)	0.50 (0.27–0.93)	0.31 (0.02–4.44)
<i>Annual household income</i>			
Less than \$20k	1.44 (1.27–1.63)	1.40 (1.01–1.95)	2.31 (1.80–2.97)
\$20k– <\$50k	1.16 (0.81–1.65)	0.87 (0.52–1.48)	1.06 (1.06–1.06)
\$50k–\$75k	0.82 (0.43–1.56)	0.88 (0.53–1.46)	0.54 (0.47–0.61)
<i>Geographic</i>			
Large Metro	2.26 (1.51–3.38)	1.07 (0.68–1.70)	1.74 (1.28–2.36)
Small Metro	2.16 (0.51–9.12)	1.02 (0.45–2.33)	0.88 (0.06–12.07)
<i>Risk factor/risk propensity</i>			
No father in home	1.69 (0.69–4.14)	1.87 (1.82–1.92)	3.37 (1.15–9.86)
Dropped out of school	1.73 (1.05–2.86)	2.71 (0.52–14.13)	1.66 (0.39–7.01)
Ever incarcerated	3.59 (1.91–6.75)	2.64 (2.13–3.28)	23.17 (4.45–120.70)
Get a real kick out of danger	3.63 (2.19–6.02)	3.01 (1.82–5.00)	11.34 (3.37–38.14)
Like to test self w/risk	2.28 (1.72–3.01)	1.13 (1.11–1.16)	1.57 (1.09–2.25)
<i>Mental health</i>			
Lifetime depression	2.13 (0.62–7.31)	1.33 (0.64–2.78)	1.77 (0.69–4.45)
Lifetime anxiety	2.20 (0.20–23.68)	2.46 (0.85–7.08)	11.06 (1.97–62.16)
<i>Parental involvement</i>			
Parents check homework	0.50 (0.20–1.24)	0.35 (0.29–0.42)	0.37 (0.34–0.40)
Parents help w/homework	1.09 (0.64–1.85)	1.00 (0.52–1.91)	0.44 (0.35–0.56)
Parents limit TV	1.08 (0.55–2.11)	0.60 (0.30–1.22)	0.45 (0.13–1.58)
Parents limit nighttime out	0.60 (0.50–0.72)	0.92 (0.77–1.08)	1.53 (1.26–1.87)
Parents positive reinforce	0.49 (0.25–0.98)	0.92 (0.21–4.13)	0.91 (0.64–1.29)
Parents voice pride	0.37 (0.14–0.99)	0.52 (0.29–0.94)	0.27 (0.24–0.31)
Talk w/parent – drug dangers	1.44 (1.19–1.75)	0.52 (0.48–0.57)	0.55 (0.19–1.58)
<i>Youth experiences</i>			
Participated – anti-violence	2.14 (1.44–3.17)	0.89 (0.81–0.97)	2.19 (1.40–3.42)
Participated – anti-drug	7.80 (2.03–29.98)	1.95 (0.97–3.92)	5.27 (2.88–9.64)
Participated – drug abuse	0.30 (0.05–1.71)	1.06 (0.10–11.80)	4.20 (0.09–206.74)
Participated – youth activities	2.68 (0.65–10.97)	2.96 (1.64–5.32)	5.12 (4.01–6.55)

Reference = Low risk class, Odds ratios and confidence intervals in bold are statistically significant.