

# Risk Factors Associated With Problem Use of Prescription Drugs

Linda Simoni-Wastila, PhD, and Gail Strickler, MS

We estimate the prevalence of and risk factors for the problem use of prescription drugs, overall and by therapeutic class. Applying logistic regression analysis to data from the National Household Survey on Drug Abuse,<sup>1</sup> we found that nearly 1.3 million Americans aged 12 years and older experience problem use of prescription drugs signifying physiological dependence or heavy daily use. Those at greatest risk include older adults, females, those in poor/fair health, and daily alcohol drinkers.

Recent data document that 10 million individuals, or 7% of the US population, reported nonmedical use of prescription drugs in 1999.<sup>1</sup> Nonmedical prescription drug use, which encompasses drug taking behaviors ranging from noncompliance to recreational use to abuse, does not adequately measure problem use of prescription drugs requiring treatment intervention.<sup>2,3</sup> Using data from the National Household Survey on Drug Abuse (NHSDA),<sup>1</sup> we estimate the prevalence of problem use of prescription drugs and elicit risk factors for such use.

## METHODS

The NHSDA, the premier data source on the prevalence of substance use,<sup>4-6</sup> is a multi-stage area probability sample survey of households representative of the noninstitutionalized US population aged 12 years and older. To obtain sufficient sample size, we used NHSDA data from 1991 through 1993 to construct a sample of 4049 respondents reporting any NHSDA-defined<sup>4-6</sup> past-year nonmedical prescription drug use.

Nonmedical prescription drug users were designated problem users if they met criteria for dependency/heavy use. Dependency required meeting 2 of 5 criteria: (1) inability to

cut down; (2) getting less work done; (3) using substance in past month and being depressed, argumentative, anxious, or upset, feeling isolated, and/or having health problems and/or difficulty thinking clearly; (4) needing larger amounts; or (5) experiencing withdrawal symptoms.<sup>7,8</sup> As defined in the NHSDA, heavy use is daily nonmedical use of 1 or more prescription drugs for at least 2 weeks in the past year.<sup>4-6</sup>

Explanatory variable selection was guided by earlier studies<sup>9-11</sup> and literature review<sup>12-23</sup> of the medical and nonmedical use of abusable prescription drugs. Covariates incorporated on this basis include race, age, gender, marital status, urbanicity, education, work status, health insurance, income, and general health status. Daily alcohol use and past-year use of illicit drugs controlled for polysubstance use.

Multivariate logistic regression analysis was used to model the probability of problem use of any prescription drug, as well as of narcotic analgesics, minor tranquilizers, stimulants, and sedative-hypnotics. Analyses were conducted with SAS (SAS Institute, Inc, Cary, NC) and SUDAAN (Research Triangle Institute, Research Triangle Park, NC) to adjust for the clustering inherent in the NHSDA.<sup>24,25</sup> To account for the stratified sampling design of the NHSDA, prevalence and logistic estimates were weighted to provide nationally representative demographic and use patterns.<sup>24,25</sup>

## RESULTS

Annually, more than 8.2 million individuals, or 4% of the US population, reported

any past-year nonmedical use of prescription drugs (Table 1). Of these, 1.3 million individuals (15.5%) were categorized as problem users of prescription drugs. Being female, being in poor/fair health, and drinking alcohol daily are potential risk factors for problem use of any prescription drug, whereas young age (<25 y) and full-time employment appear to protect against problem use (Table 2).

Analysis by therapeutic class revealed that being female, unmarried, and age 35 years and older increase the odds of problem use of narcotic analgesics (Table 2). Factors predictive of problem use of tranquilizers include female gender, White race, high school completion, poor/fair health, and daily drinking. For sedative-hypnotics, poor health increased the likelihood of problem use, and income less than \$40 000 reduced it. Past-year illicit drug use reduced the odds of problem use of all 3 classes. No variables reached statistical significance in predicting problem use of stimulants.

## DISCUSSION

Problem use of prescription drugs is not insignificant—nearly 1.3 million US citizens report problem use of prescription drugs each year. In addition to nonmedical use, factors associated with problem use include older age, female gender, poor/fair health status, and daily drinking. Other factors, including marital status, education, employment status, and income, are uniquely associated with individual therapeutic classes. Because many of these factors also predict nonmedical prescription

**TABLE 1—Annualized Population Estimates of Past-Year Nonmedical and Problem Prescription Drug Use**

Therapeutic Class	Past-Year Nonmedical Use		Any Problem Use		Past-Year Nonmedical Users (%)
	n	US Population(%)	n	US Population(%)	
Any Prescription Drug	8 266 000	4.03	1 279 000	0.62	15.47
Narcotic Analgesics	4 844 000	2.35	499 000	0.24	10.30
Stimulants	2 351 000	1.14	437 000	0.21	18.59
Minor Tranquilizers	2 982 000	1.45	388 000	0.19	13.01
Sedative-Hypnotics	1 840 000	0.90	350 000	0.17	19.02

**TABLE 2—Probability of Prescription Drug Problem Use Overall and by Therapeutic Class**

Variable	Any Prescription Drug Adjusted OR (95% CI)	Narcotic Analgesics Adjusted OR (95% CI)	Minor Tranquilizers Adjusted OR (95% CI)	Sedative-Hypnotics Adjusted OR (95% CI)	Stimulants Adjusted OR (95% CI)
Age 12–17a	0.53 (0.31, 0.91)**	0.37 (0.16, 0.88)**	0.35 (0.96, 1.28)	0.47 (0.16, 1.37)	0.95 (0.31, 2.94)
Age 18–24a	0.48 (0.32, 0.74)*	0.29 (0.15, 0.58)*	0.63 (0.31, 1.28)	0.51 (0.20, 1.33)	0.79 (0.30, 2.08)
Age 25–34a	0.78 (0.55, 1.11)	0.59 (0.33, 1.06)	0.47 (0.27, 0.84)**	0.99 (0.46, 2.13)	1.52 (0.63, 3.57)
Female	1.49 (1.06, 2.08)**	2.00 (1.10, 3.70)**	2.00 (1.03, 3.85)**	1.06 (0.57, 1.96)	0.95 (0.56, 1.64)
White	1.28 (0.85, 1.92)	1.18 (0.66, 2.08)	2.44 (1.30, 4.76)*	1.00 (0.48, 2.08)	1.67 (0.95, 2.94)
Urban	0.90 (0.63, 1.30)	1.06 (0.53, 2.13)	0.96 (0.44, 2.08)	0.65 (0.25, 1.69)	0.69 (0.38, 1.28)
Not Married	1.39 (0.89, 2.13)	2.38 (1.25, 4.54)*	1.56 (0.75, 3.23)	1.33 (0.57, 3.13)	1.16 (0.64, 2.08)
High School Graduate	0.76 (0.49, 1.19)	0.68 (0.27, 1.67)	2.13 (1.02, 4.35)**	0.54 (0.26, 1.11)	0.96 (0.48, 1.89)
Employed Work Status	0.65 (0.43, 0.95)**	0.67 (0.37, 1.19)	0.86 (0.41, 1.82)	0.86 (0.36, 2.04)	0.75 (0.39, 1.43)
Has Health Insurance	1.33 (0.93, 1.92)	1.39 (0.76, 2.50)	1.14 (0.61, 2.13)	1.47 (0.68, 3.23)	1.67 (0.93, 3.03)
Income \$20 000–40 000b	0.84 (0.57, 1.23)	0.81 (0.42, 1.59)	1.25 (0.61, 2.56)	0.36 (0.14, 0.96)**	0.68 (0.37, 1.22)
Income > \$40 000b	0.75 (0.45, 1.23)	0.68 (0.31, 1.47)	0.41 (0.14, 1.20)	0.44 (0.12, 1.61)	0.66 (0.31, 1.41)
Poor/Fair Health	2.17 (1.33, 3.45)*	2.04 (0.95, 4.54)	2.94 (1.41, 6.25)*	2.04 (1.02, 4.00)**	1.11 (0.53, 2.33)
Daily Alcohol Use	1.64 (1.11, 2.38)*	1.56 (0.90, 2.70)	2.94 (1.52, 5.56)*	0.96 (0.46, 2.00)	1.56 (0.83, 2.94)
Past-Year Illicit Drug Use	0.95 (0.67, 1.35)	0.56 (0.35, 0.90)**	0.32 (0.19, 0.55)*	0.44 (0.20, 0.96)**	0.81 (0.46, 1.43)

Note. OR = odds ratio; CI = confidence interval.

<sup>a</sup>Reference is age  $\geq$  35 years old.

<sup>b</sup>Reference is annual income < \$20 000.

\* $P \leq 0.01$ ; \*\* $P \leq 0.05$ .

drug use,<sup>9,11,15</sup> they may be useful in identifying individuals at risk for problem use. Finally, although other studies have linked nonmedical drug use to illicit drug use,<sup>9,11,26–29</sup> our findings suggest that problem use of narcotics, sedative-hypnotics, and minor tranquilizers occurs in the absence of illicit drug taking. This may reflect differences in individuals reporting a primary problem of prescription drug use needing treatment versus polysubstance users who nonmedically use prescription drugs as adjuncts to illicit drug use.

Although recent NHSDA reports document the relative stability of nonmedical drug use over time,<sup>1,30</sup> further analysis using current data is needed to corroborate the prevalence of problem use of prescription drugs. Also, these findings are likely conservative estimates due to underreporting associated with the NHSDA and other self-report data.<sup>31,32</sup> Finally, definitions of nonmedical use, dependency, heavy use, and problem use, although used elsewhere,<sup>7</sup> require further validation and refinement.

Despite these limitations, this study is the first to estimate the prevalence of problem use of prescription drugs potentially requiring treatment and associated risk factors. Further

studies are needed to explore alcohol and drug use patterns and risk factors among polysubstance users. Research also is required to provide an improved understanding of the continuum comprising medical exposure, non-medical use, and problem use of prescription drugs with addiction potential. ■

#### About the Authors

Linda Simoni-Wastila is with the Department of Pharmaceutical Health Services Research, School of Pharmacy, University of Maryland, Baltimore. Gail Strickler is with the Schneider Institute for Health Policy, Heller Graduate School, Brandeis University, Waltham, Mass.

Requests for reprints should be sent to Linda Simoni-Wastila, PhD, University of Maryland, School of Pharmacy, Department of Pharmaceutical Health Services Research, 515 W Lombard St, Rm 275, Baltimore, MD 21201 (e-mail: lsimoniv@rx.umaryland.edu).

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#### Contributors

L. Simoni-Wastila designed the study, developed the analytic plan, supervised the data analysis, and wrote the brief. G. Strickler conducted all programming and contributed to writing the brief.

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#### Human Participant Protection

The Brandeis University institutional review board exempted this research from human subjects review because it employs public-use secondary data.

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