Original article

Motivational Subtypes of Nonmedical Use of Prescription Medications: Results From a National Study

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A B S T R A C T

Purpose: Very little research has examined the heterogeneity associated with the nonmedical use of prescription medications (NUPM) in nationally representative samples of adolescents. The main objectives of this study were to (1) identify motivational subtypes of past-year NUPM among high school seniors in the United States using a person-centered approach, and (2) examine the associations among motivational subtypes and characteristics of substance abuse (i.e., route of administration, co-ingestion, and subjective high).
Methods: Self-administered questionnaires as part of the Monitoring the Future study were completed by nationally representative samples of high school seniors (modal age, 18 years). The sample consisted of five cohorts (senior years of 2002–2006) made up of 12,431 high school seniors in total, of which 53% were women.
Results: Approximately 75% of past-year nonmedical users of prescription opioids, stimulants, and tranquilizers endorsed more than one motive. Latent class analysis indicated five motivational subtypes associated with nonmedical use of prescription opioids (experiment, relax, get high, pain relief, and affect regulation), four subtypes of prescription stimulants (weight loss/enhance energy, enhance energy/awake/high, experiment, and affect regulation), and five subtypes of prescription tranquilizers (experiment, get high, relax/sleep, relax, affect regulation). Recreational subtypes were positively associated with characteristics of substance abuse, whereas self-treatment subtypes were associated with medical use before nonmedical use.
Conclusions: Because multiple motives underlie NUPM, identifying subgroups of individuals who endorse combinations of motives, versus a single motive, will better inform intervention efforts to reduce nonmedical prescription medication use.

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IMPLICATIONS AND CONTRIBUTION

High school seniors were grouped into similar categories according to their motivations for using prescription medications nonmedically, thereby allowing for a better understanding of why adolescents engage in such risky behavior. We identified individuals who were at higher risk for substance abuse, and such information can be used to guide intervention efforts.

Several studies have shown that the nonmedical use of prescription medications (NUPM) has significantly increased over the past 2 decades and is most prevalent among adolescents and young adults [1–6]. Despite these recent increases, very little research has examined the motivations for NUPM in nationally

representative samples [7]. Many existing studies often fail to distinguish between individuals who nonmedically use someone else's prescription medications to self-treat a medical condition and those who use someone else's prescription medications recreationally [8]. The findings from at least two regional studies indicate that motivations for NUPM are varied and associated with different adverse consequences among adolescents and young adults [9,10]. These findings warrant additional investigations within national samples of adolescents, as there is a lack of epidemiologic research that accurately assesses the motivations

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and characteristics of those individuals at greatest risk for substance abuse [7,11,12].

At least four studies have examined individual motivations associated with nonmedical use of prescription opioids, stimulants, and tranquilizers among secondary students [9,13–15]. All these studies used variable-centered analytical approaches and focused on individual motivations. Because individuals are likely to have multiple motivations underlying their behavior, identifying categories of individuals who endorse combinations of motivations, versus a single motivation, offers a valuable complementary approach to variable-centered approaches. Muthén and Muthén (2000) elaborated the distinction between variable-centered and person-centered statistical methods [16]. Variable-centered approaches focus on the relationships between variables, whereas person-centered approaches focus on the relationships among persons. In contrast to variable-centered approaches, the goal of person-centered approaches "is to group individuals into categories, each one of which contains individuals who are similar to each other and different from individuals in other categories" [16]. Examples of person-centered approaches include cluster analysis and latent class analysis (LCA), both of which can be used to group individuals into similar categories according to their motives for nonmedical use (referred to as motivational classes or subtypes).

LCA has been previously used in the analysis of illicit drug use [17], alcohol use disorders [18,19], adolescent drinking [20], antisocial personality disorder symptoms among alcohol-dependent subjects [21], adolescent sedative/anxiolytic misuse [22], and the comorbidity of adolescent problem behaviors [23]. For example, an investigation examined the relationships between different patterns of drinking motivations and behaviors in a sample of U.S. 12th grade students using a person-centered approach [20]. The results of this study identified four motivational classes for alcohol use, including Experiment, Thrill-seek, Multi-reason, and Relax. The results also indicated that the riskiest drinking behaviors were related to membership in the Multi-reason class. Despite these recent advances in the alcohol literature, motivational subtypes of NUPM among adolescents have not been examined using person-centered approaches.

The objectives of this study were to (1) identify the motivational subtypes of NUPM within U.S. high school seniors using a person-centered approach, and (2) examine variations in these motivational subtypes of NUPM by characteristics of substance abuse (i.e., route of administration, co-ingestion, and subjective high).

Methods

Participants and procedures

The *Monitoring the Future* study (MTF) annually surveys a cross-sectional, nationally representative sample of high school seniors in approximately 135 public and private schools in the coterminous United States. MTF uses a multistage sampling procedure: in stage 1, geographic areas or primary sampling units are selected; in stage 2, schools within primary sampling units are selected (with probability proportionate to class size); and in stage 3, students within schools are selected. The student response rates for high school seniors ranged from 82% to 83% between 2002 and 2006. Because so many questions are included in the MTF, much of the questionnaire content is divided into six different questionnaire forms, which are randomly distributed.

This approach results in six virtually identical subsamples. The measures relevant for this study were asked on Form 1; therefore, this study focuses on the subsamples receiving Form 1 within each cohort (for more information on the procedures see [3]).

The total sample size was 12,431 high school seniors. Sample sizes for each year were as follows: 2,256 for 2002, 2,556 for 2003, 2,563 for 2004, 2,581 for 2005, and 2,475 for 2006. The sample included 53% women, 62% white, 10% black, and 28% were from other racial groups or did not specify their race. The modal age of the individuals in the sample was 18 years. Subsamples for the current study are described in detail in the following text.

Measures

NUPM was assessed with a series of items asking respondents on how many occasions (if any) in the past 12 months they used prescription medications on their own, without a doctor's orders. There were separate questions for each prescription medication class:

(a) Prescription opioids (e.g., Vicodin, OxyContin, Percodan, Percocet, Demerol, Dilaudid, methadone, morphine, codeine);
(b) Prescription tranquilizers (e.g., Librium, Valium, Xanax);
(c) Prescription stimulants (e.g., Ritalin, Dexedrine).

The response scale ranged from 1 (no occasions) to 7 (40 or more occasions).

Motives for NUPM were assessed by asking respondents who reported past-year NUPM to indicate the most important reasons for NUPM from a check-all-that-apply list of binary items.

Subjective high of NUPM was measured with three items that asked past-year nonmedical users how high they usually get when they use each prescription medication class. The response scale for these items ranged from 1 (not at all high) to 4 (very high).

Co-ingestion of NUPM and other drugs was measured with nine items focused on the number of times each prescription medication class was used nonmedically at the same time as other drugs such that the effects overlapped (e.g., alcohol, marijuana, LSD, hallucinogens other than lysergic acid diethylamide, prescription opioids, stimulants, tranquilizers, cocaine, heroin) in the past 12 months. The response scale ranged from 1 (not at all) to 7 (every time).

Routes of administration of NUPM were assessed with five items that asked which methods respondents used for past-year NUPM. The binary items included: (1) intranasal (snorting or sniffing), (2) smoking, (3) injection, (4) orally (by mouth), and (5) other.

Medical use of prescription medications was assessed by asking respondents whether they had ever taken each prescription medication class because a doctor told them to use them. Respondents were informed that prescription medications are sometimes prescribed by doctors, and that drugstores are not supposed to sell them without a prescription. The response scale included: (1) no medical use, (2) medical use before NUPM, and (3) NUPM before medical use.

Data analysis

Questions about motives for NUPM were asked only of those who reported nonmedical use in the past year. Accordingly,