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Nonmedical Use of Prescription Medications in Young Adults

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Abstract

Nonmedical use of prescription medications (NUPM) is an area of increasing public health concern, particularly in young adults. Young adults aged 18 to 25 have the highest annual and monthly rates of NUPM of any age group in the US, with notable consequences from using opioid, stimulant, tranquilizer and sedative medication. This article will review the literature on young adult NUPM, focusing first on the characteristics of those young adults engaged in NUPM. Then, we will examine the most common motives for NUPM, the sources young adults use to engage in nonmedical use and the related process of medication diversion. Finally, we will outline treatment and make specific recommendations of ways clinicians can help prevent the spread of NUPM in young adults, completing the work by covering future directions for research.

INTRODUCTION

Nonmedical use of prescription medications (NUPM) is currently the fastest growing drug problem in the United States.[1,2] According to results from the National Survey on Drug Use and Health (NSDUH), in 2011 6.1 million Americans aged 12 and older used prescription drugs nonmedically in the past month, and 2.3 million used prescription drugs nonmedically for the first time within the past year.[1] NUPM often focuses on opioids, tranquilizers, stimulants, and sedatives,[3,4] and research has shown that Americans are most likely to nonmedically use opioids, followed by tranquilizers, stimulants, and sedatives.[1] NUPM is defined as using a medication without a prescription or taking a medication simply for the experience it causes.[1] Conversely, misuse is defined as nonmedical use as well as inappropriate use (eg, using Adderall for ADHD as prescribed but occasionally taking an extra dose to augment the effects of the first dose). Although the term *abuse* also appears in the literature (along with the term *misuse*), because of confusion with the criteria as spelled out in the *Diagnostic and Statistical Manual of Disease,* fourth edition (DSM-IV), and unclear connotations, it is less often used. Although there is no consensus regarding the definition of *misuse* and *nonmedical use* and the appropriate use of each term,[3] this article focuses on *nonmedical use* as previously defined; however, articles that examine medical misuse are also included and noted where appropriate.

With rising rates of NUPM, overdose deaths from prescription opioids have drastically increased in the past decade.[2] In 1999, roughly 4000 people were killed by an overdose of prescription opioids, but by 2008 this number had increased to nearly 15,000.[2] Similarly,

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rates of NUPM-related emergency department (ED) and treatment utilization have increased in tandem with rates of NUPM.[5–8] From 2004 to 2011, ED visits resulting from opioid use increased by 245% in the 21- to 24-year-old age group and 150% in the 18 to 20 cohort; those from benzodiazepine use increased by 233% (21–24 years) and 84% (18–20 years); and ED visits from stimulants increased by 681% (21–24 years) and 160% (18–20 years). All increases were significant at a p level of .05.[9] In 2010, young adults aged 18 to 25, inclusive, accounted for 33% of all treatment episodes for opioids and 25.2% of all tranquilizer treatment episodes.[10] Consequently, in addition to the increased risk of overdose and dependence, NUPM has led to increased costs for health insurers. It is estimated that the direct health care cost from nonmedical use of prescription opioids is more than $72.5 billion annually.[2] Further, it is estimated that the cost to private insurers for misuse of prescription stimulants is between $83 million and $204 million annually.[11] It should be noted, however, that though these costs are significant, they do not represent the additional cost to the health care system from NUPM such as tranquilizers and sedatives, where research is sparse.

The population with the highest rate of NUPM is young adults aged 18 to 25.[1] As outlined in Table 1, young adults are most likely to nonmedically use prescription opioids, followed by stimulants, tranquilizers, and sedatives.[12] This is in contrast to NUPM at the national level, where tranquilizer NUPM is more common than stimulant NUPM.[1] According to the 2011 NSDUH, 5% of young adults nonmedically used a controlled substance in the past month.[1] This figure may be as high as 7.8% for college students,[13] and at least one study indicated much higher rates of lifetime NUPM in college students, though this finding may be somewhat of an outlier.[14] Additionally, research suggests rates of NUPM are rising among US college undergraduates.[15] In fact, data from McCabe, West, and Wechsler[16] suggest NUPM increased from 4.41% in 1993 to 9.97% in 2001 in a sample of 119 4-year universities from around the country; the authors believe this to be a conservative estimate.[16] Data from the Monitoring the Future series of nationwide surveys indicate that changes in both lifetime and past year NUPM rates have been relatively small since 2001 in both young adults generally and college students within this group.[17] (See Table 1.)

As a result of increased rates of NUPM in young adults, it is important to educate physicians and other nonphysician clinicians on the issues surrounding NUPM in hopes of mitigating the problem. This article attempts to define and condense the discussion by addressing the prevalence, risk factors, motives, sources, diversion, and treatment of NUPM in the 18 to 25 age population. Furthermore, we will highlight limitations in the literature and comment on the direction of future research.

PREVALENCE

Research on NUPM predominantly focuses on stimulants and opioids, as nonmedical use from these classes of medication is more prevalent than NUPM of tranquilizers and sedatives. Recent interest in prescription stimulant research stems from the wide availability of these medications on college campuses.[18] The prevalence rates of lifetime nonmedical use of prescription stimulants vary from 6.9% to 19.8%,[12,19–22] with region of college and competitive admission standards contributing to the variability.[20] Specifically, colleges

located in the northeastern region of the United States and colleges with more competitive admission standards are associated with higher rates of nonmedical use of prescription stimulants. [20] Research has shown past year prevalence among college students ranges from 0% to 25%.[20] In 2011 the nationwide annual prevalence of stimulant NUPM among college students was 9.3%,[17] with an annual prevalence of 7.2% for all young adults.[17] It should be noted that these figures only include use outside of a valid prescription and do not capture misuse of prescribed medication.

Although more research on prescription stimulants exists in the literature, most of the data point to prescription opioids being the most common medication used nonmedically on college campuses,[12] second only to marijuana in illicit drugs used.[23] The prevalence of lifetime nonmedical use of prescription opioids varies from 9.3% to 14%,[15,24,25] with an annual prevalence of 7% to 9%.[24,26] More recent data suggest the annual prevalence rate is slightly lower: 2.4% to 5.8% among college students in 2011.[17]

Regarding data on nonmedical tranquilizer and sedative use by young adults, the literature is poorly developed. In one study, McCabe[27] found the lifetime prevalence of benzodiazepine anxiolytic use to be 7.8% among young adults, with a past year prevalence of 4.5%; and according to data from the nationwide Monitoring the Future survey,[17] the lifetime prevalence of use for sedatives (barbiturates) and tranquilizers among college students was 3.6% and 7.1%, respectively. The lifetime prevalence of use for these medications among all young adults was notably higher at 7.9% and 13.8%, respectively.

Although preliminary evidence suggests that rates of NUPM may be higher in noncollege student young adults,[28–31] these studies have focused on unique samples of the young adult population (eg, low-income young adult women, socially active urban young adults), and more research is necessary to confirm speculation.

RISK FACTORS FOR NONMEDICAL USE

An analysis of the literature reveals many common risk factors for nonmedical use among young adults enrolled in college, regardless of the medication class. Caution should be applied in interpreting these results because the cross-sectional data preclude interpretations of causality; for instance, prior NUPM may have led to poorer academic performance, or students could have been drawn to NUPM to cope with increasingly poor academic performance after NUPM. Consistent correlates of NUPM include being white, having a lower GPA, and being a member of a sorority or fraternity.[12,19–21,23,26] Research has also found a correlation between NUPM and lifetime history of exposure to traumatic events,[32] major depressive disorder,[33] and lifetime history of rape in women.[34] However, research also shows there are additional correlates of NUPM that are specific to particular medication classes.

Nonmedical users of prescription stimulants are more likely to be male, diagnosed with ADHD,[35] have Jewish religious affiliation, have greater economic resources, and attend a noncommuter college.[19,20] Moreover, most are polydrug users,[36,37] and research indicates there is a relationship between nonmedical use of stimulants and degree of psychological

distress, internal restlessness, stress, anxiety, and internal impulsivity.[21,38] In fact, higher ratings on these risk factors significantly predict nonmedical use. Affiliation with a sorority or fraternity seems to be a particularly salient risk factor for nonmedical use of prescription stimulants. In one study[21] of 1033 undergraduates nationwide, nonmedical use of prescription stimulants was reported by 19.8% of the sample. However, among students who identified as being a member of a social sorority or fraternity, 35.6% endorsed using prescription stimulants for nonmedical purposes. Additionally, misuse of prescription stimulants (nonmedical use or inappropriate use of prescribed medication) has been linked to cigarette smoking, binge drinking, illicit use of cocaine, screening positive on the Drug Abuse Screening Test 10 (DAST-10),[39] and depressed mood.[40]

Nonmedical users of prescription opioids are more likely to have been previously prescribed opioids and to live in a house or apartment off campus.[23] These young adults are also more likely to attend a more competitive 4-year university, use other drugs, and engage in other risky behavior such as driving after binge drinking or being a passenger with a drunk driver.[26] Further research shows that most use alcohol concurrently with prescription opioids (58%) and typically drink more per day than nonconcurrent users.[25] Although there are no gender differences in rates of opioid NUPM,[26] some correlates of opioid NUPM may differ by gender. Zullig and Divin[41] found that college females who reported feeling sad, hopeless, or depressed had significantly greater odds of engaging in nonmedical use of prescription opioids than males endorsing such symptoms; similarly, females endorsing feeling depressed were at higher odds than males of stimulant and benzodiazepine NUPM.[41] In addition, research suggests that for prescription stimulants and opioids there is a relationship between perceived harmfulness, sensation seeking, and nonmedical use.[42] Unsurprisingly, low perceived harmfulness and high sensation seeking were associated with NUPM.

Although there is little research on nonmedical use of tranquilizers and sedatives, it can be extrapolated that the risk factors for stimulants and opioids are applicable to the former as well. At least one study[27] found that in addition to being white, college students who had both male and female sex partners and reported higher rates of substance use (as measured by self-report) and other risky behaviors were more likely to nonmedically use benzodiazepine anxiolytics. Alternatively, nonmedical use of benzodiazepines is less likely to occur in college students who are Asian or Hispanic.[27]

Although data are lacking on NUPM in noncollege young adults, research from Kelly and colleagues[29–31] suggests that young adults who are white and socially active in nightlife venues are at increased risk for NUPM, with lower odds of lifetime and recent misuse among black, Hispanic, and Asian young adults.

MOTIVES

Although much is known about the prevalence of and risk factors for NUPM, the motives behind use by college students are understudied,[24] and virtually nothing is known about the motives for NUPM in noncollege young adults. Research[21,36,43–45] has indicated that the most common motivation (93.5% of one sample)[45] for nonmedical use of prescription stimulants among college students is to improve academic performance. Specifically, these

students engage in stimulant NUPM to enhance concentration, help with studying, and improve alertness. [43,44] Other motivations include curiosity, staying awake to party, and getting high.[36,46] Nonmedical use of prescription stimulants has been positively associated with self-reported attention difficulties, suggesting that college students perceive such difficulties as an impediment to their academic success and may be attempting to self-medicate an undiagnosed or undertreated condition.[44] Curiosity is more likely to be cited as the primary motivation for nonmedical stimulant use early in college, whereas studying is more likely to be cited as the primary motivation later in college.[46]

Regarding motives for nonmedical use of prescription opioids in college students, one study[24] found pain relief to be the primary motivation, and those who cited pain relief as the sole motivation (ie, self-medicators) did not have an increased risk for other substance abuse problems. Alternatively, participants who reported motivations other than pain relief were 15 times more likely to experience 3 or more drug use–related problems compared with participants who did not report nonmedical use of prescription opioids.[24]

SOURCES FOR YOUNG ADULTS ENGAGED IN NUPM

Available data suggest, overwhelmingly, that college students obtain prescription medications for nonmedical use from friends and peers (which tends to include both those seen as friends by the participant and other students she or he has contact with),[19,44,46] with 92% of one sample citing friends and peers as their supplier of prescription stimulants.[19] Family members were also cited as a source of prescription medications, but this was noted more for prescription opioids, tranquilizers, and sedatives than stimulants[15,23] and was more likely to occur among women and blacks.[15] Respondents who cited family members (with parents as the most common family member) as the source of prescription opioids stated that their motivation for NUPM was to allay pain or discomfort and was not for the purpose of getting high; in contrast, those obtaining medications from friends and peers did so for recreational purposes (eg, to get high).[23] Usually, the parent supplying the opioid to his or her child had leftover medication from a prior and legitimate prescription or, less commonly, was a medical professional with access to such medication.[23]

In a longitudinal study on nonmedical use of prescription stimulants in college students, Garnier-Dykstra and colleagues[46] found that most users acquired the medication from a friend and did not pay for it. However, the number of participants who endorsed a willingness to spend $5 or more per pill more than doubled from freshman year to senior year of college.[46] The authors note that, for a subset of the sample, this trend may reflect an increase in perceived need for the stimulant, resulting in a greater willingness to pay more to obtain it.

McCabe and Boyd[15] suggest there may be a notable difference between students who obtain prescription medications from family members and those who obtain them from nonfamily sources (eg, friends, peers). Participants who cited nonfamily sources were significantly more likely to also report higher alcohol and drug use (eg, more than 4 times more likely to report heavy episodic drinking) than those who cited family sources. Thus, because of the relationship to substance abuse, the former may be considered a high-risk population.[15]

Additional sources, such as drug dealers or purchases abroad, were rarely cited.[15,19] Although research suggests that prescription medications are widely available on the Internet,[47–49] there is little to no evidence that young adults are using the Internet to acquire prescription medications for nonmedical use.[15,19]

DIVERSION BY YOUNG ADULTS TO THOSE SEEKING TO ENGAGE IN NUPM

Although undergraduate women are more likely to be prescribed pain medication, undergraduate men are more likely to be approached to divert their prescription. [12,23] However, this gender difference is exclusive to prescription opioids and has not been observed for other medication classes.[19] Research shows that the number of students who have diverted their prescription opioid or stimulant medication varies from 26% to 36%,[39,44,50, 51] with many more students approached to divert stimulants (54%–56%)[12, 44] than opioid (26%) or benzodiazepine and sedative medications (19%).[12] Students with prescription stimulants are more likely to be approached to divert their medication than students with other prescriptions; [19,51] at least one study[44] found similar rates of diversion between a public and private university. Unsurprisingly, prescription stimulants and opioids were the most commonly diverted medication classes, with tranquilizers and sedatives less commonly diverted.[12,51]

Most college students who divert their medication share their medications rather than sell them, suggesting that the incentive is not financial most of the time.[51] Diversion has also been linked to the number of prescription drugs used nonmedically in the past year[51] and childhood conduct problems.[52] In fact, each prescription drug used nonmedically in the past year increased the chances of diverting a prescription medication by 52%, and each childhood conduct problem increased the chances of diverting by 13%. Those who divert their medications also have a greater likelihood of NUPM and other illicit drug use than nondiverters.[51] Thus, diversion of prescription medications may be both a matter of simple access and symptomatic of a more global behavioral problem.[51]

In a study by Arria et al,[50] 171 college students who were prescribed opioid analgesics for acute pain within the last year were interviewed to see if individuals who underuse their medication or individuals who overuse their medication are at greater risk for diversion. Overall, 26.3% of those prescribed opioids underused their medication and 16.4% overused their medication, with 29% of the sample diverting their medication. However, those who overuse were much more likely to divert their medication. Those who underuse did not statistically differ from adherent users in likeliness to divert, and data in adolescents indicate that adolescents who underuse opioids may be more motivated to later use the retained medication for self-medication (pain relief) than for recreational purposes or diversion to another person.[53] The authors found that those who overuse were almost 5 times as likely as adherent users to divert their medication, and more than 8 times as likely as those who underuse. It should be noted that the analyses on diversion included a small number of nonopioid analgesic users or users of an unknown class of analgesic (12 and 9, respectively, of the total sample of 192).

PREVENTION AND TREATMENT STRATEGIES

As research continues to evaluate factors related to NUPM in young adults, it is necessary for professionals to take action. This requires that physicians, other health professionals, researchers, and college administrators work concomitantly to address NUPM from multiple perspectives. Although there are not sufficient data to draw firm conclusions on the efficacy of specific prevention and intervention efforts, many suggestions have been proposed. These strategies are the beginnings of a dialogue to address a growing problem.

The primary defense against NUPM in young adults lies with health professionals. As the physicians and nonphysician clinicians treating these patients who are involved (directly or indirectly) in medication prescribing decisions, they can serve as gatekeepers. Physicians must first disseminate information about the primary effects, side effects, and risks associated with each medication to their patients.[18,20,25,26,51,54] Physicians should caution against diversion by reminding patients that it is illegal and that, although it may seem harmless, nonmedical use of a prescription medication can trigger an adverse reaction in some individuals, particularly if other substances are involved.[12,18] It is also recommended that physicians encourage their patients to not tell anyone (eg, friends, roommates) about their medication so the medication is less likely to be stolen and diversion requests are likely to be fewer.[20,26] Physicians may consider contracts with patients stating they will take their medication as prescribed and will not divert,[26] though the evidence that treatment contracts (and urine testing) to prevent NUPM or diversion in adult chronic pain patients is somewhat mixed.[55]

Clinical staff should follow up with patients to inquire how a medication is working and how much of the medication the patient is using, particularly for newer prescriptions.[18,56] Based on this information, they may want to consider prescribing fewer pills and refills and scheduling less time between follow-up appointments.[39] Furthermore, physicians should consider medication treatments with less risk for abuse. For ADHD, this includes nonstimulant medications such as atomoxetine and bupropion, although these are generally believed to be less efficacious,[57] or long-acting agents, such as Concerta, which is less prone to abuse because of its delivery system.[12,19,20,51] For prescription opioids, this includes increased usage of nonopioid analgesics (eg, nonsteroidal anti-inflammatory agents).[26] Physicians may also consider the use of nonpharmacologic therapies such as mindfulness-based meditation[58] and cognitive behavioral therapies[59] for pain and psychiatric conditions in lieu of medication treatment.

In addition to educating patients, physicians should conduct clinical interviews to screen patients for diversion or potential nonmedical use.[37,46] Screening instruments should be considered, including the Current Opioid Misuse Measure (COMM),[60,61] the Prescription Opioid Misuse Index (POMI),[62] a stimulant NUPM measure developed specifically for college student populations,[63] or other measures like the DAST-10 to assess general addiction proneness.[37] The COMM seems to have validity in identifying adult chronic pain patients engaged in inappropriate opioid use,[61] and although further investigation into the predictive validity of the other questionnaires is needed, they all seem to have strong psychometric properties. Measures to specifically assess nonmedical sedative or tranquilizer

use are not currently available. Regarding prescription stimulants, health professionals should be particularly cognizant of heavy alcohol use, skipping class, illicit drug use, lower academic performance, and untreated ADHD symptoms.[50] Physicians may consider screening for illicit drug use through urine toxicology before writing a prescription, particularly for patients with a history of dependence or conduct problems.[46,51] As mentioned earlier, though, the evidence for the effectiveness of urine screening is mixed in adult chronic pain patients.[55]

A final way for physicians and nonphysician clinicians to limit the scope of NUPM-related problems is to serve as advocates for larger-scale public health interventions such as better adoption of prescription monitoring programs[64] and development of less abuse-prone medications.[65] Federal recommendations suggest that monitoring, using state-based prescription monitoring databases and insurance registries, can identify those patients who attempt to obtain medications from multiple physicians and who attempt early refills.[2] Although physicians may not have full access to these data, they can encourage insurance providers and legislators to mandate such screening to limit NUPM. Physicians can also advocate for the use of universal drug prevention programming in middle and high school settings because there is evidence that such a program in a middle school population decreased later NUPM when those receiving the intervention were 17 to 21 years old.[66]

From the standpoint of college administrators, Garnier-Dykstra and colleagues[46] recommend prevention efforts aimed at educating new students. These orientations could discuss the problem of NUPM on college campuses and inform new students about the risks of NUPM and diversion. These orientations could acknowledge the scope of the problem, discuss the risks associated with NUPM, highlight the effects of peer pressure to divert, the evolving motivation of college students to engage in NUPM, and help dispel the popular myth that prescription stimulants improve grades.[18] Moreover, because research has shown that college students significantly overestimate the rate of NUPM among peers,[67] these orientations should emphasize that most students are not engaging in these behaviors.

Treatment for NUPM typically relies on the principals outlined for other treatment of dependence on other drugs. The dependent individual is usually medically withdrawn from the medication and, in the case of opioid dependence, may be placed on methadone or buprenorphine maintenance.[68,69] Physicians may recommend attendance at a 12-step group or behavioral therapies such as contingency management or cognitive behavioral therapy. Generally, though, there is a dearth of research regarding whether those who nonmedically use medications require treatment that varies in frequency, intensity, and type from others with substance use problems. This is particularly true for young adults.

FUTURE RESEARCH

Through an evaluation of the literature it is clear that further research is warranted to more closely understand NUPM in young adults. In particular, it should be noted that there exists a large gap in the literature for research on noncollege young adults. Little is known about NUPM within this population, and because rates of NUPM are highest for young adults, future research should focus on this subset of the population. Although some studies have

included noncollege young adults in their sample,[28,30,31,70,71] more research is needed to parse differences between young adults currently enrolled in college and those who are not.

To further understand risk factors for NUPM, longitudinal studies are needed with a particular emphasis on differences between noncollege young adults and those currently enrolled in a university.[23,72] As part of the methodology, these studies should address the long-term morbidity and mortality associated with NUPM.[36] Moreover, future research should address diversion more fully. The motivations for diversion, the settings in which they occur, and to whom young adults are diverting their medications (intimate friends or extended acquaintances) are unknown.[51]

To assist health professionals in identifying patients at risk for nonmedical use or diversion, it is necessary to develop and test screening instruments. Researchers must work together with health professionals to develop psychometrically sound instruments that can be used as part of an overall clinical assessment. These instruments must be sensitive enough to alert health professionals to potential misusers and diverters but specific enough to not hinder access to these medications for adhering patients. It is important to keep in mind that most young adults do not use their prescription medication nonmedically for euphoric effects. In fact, the most commonly cited reason young adults used their prescription opioid nonmedically was for pain.[24] Future research should examine the quantity of pills being prescribed, whether this contributes to diversion, [36] and the efficacy of prevention and intervention programs for young adults enrolled in college and those who are not. Finally, the question of whether NUPM-related treatment should differ for young adults, compared with traditional treatment for other substance use problems in young adults, must be evaluated.

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Table 1

Lifetime, Past Year, and Past Month NUPM by Age Group from the 2011 National Survey on Drug Use and Health

	College Young Adults (18–25)	Non-College Young Adults (18–25)	Adolescents (12–17)	Adults (26 and Older)
Opioids				
Lifetime	19.7%	22.5%	8.8%	12.5%
Past Year	8.0%	11.4%	6.2%	3.2%
Past Month	2.7%	4.3%	2.3%	1.3%
Sedatives				
Lifetime	1.2%	1.7%	0.6%	3.5%
Past Year	0.4%	0.4%	0.3%	0.1%
Past Month	0.2%	0.1%	0.1%	0.1%
Stimulants				
Lifetime	9.1%	9.0%	2.0%	7.6%
Past Year	4.0%	2.2%	1.2%	0.6%
Past Month	1.2%	0.8%	0.5%	0.2%
Tranquilizers				
Lifetime	10.8%	14.6%	2.8%	8.6%
Past Year	3.9%	5.1%	1.8%	1.5%
Past Month	1.3%	1.8%	0.6%	0.6%

Source: Substance Abuse and Mental Health Services Administration. *Results from the 2011 National Survey on Drug Use and Health: Summary of National Findings*. Rockville, MD: Substance Abuse and Mental Health Services Administration; 2012. HHS Publication No. (SMA) 12-4713, NSDUH Series H-44