Illicit Use of Prescription ADHD Medications on a College Campus: A Multimethodological Approach

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Abstract. Objective: The authors used quantitative and qualitative methodologies to investigate college students' perceptions and use of illegal Attention Deficit Hyperactivity Disorder (ADHD) stimulants during spring and summer 2006. **Participants**: From fall 2005 through fall 2006, the authors studied 1,811 undergraduates at a large, public, southeastern research university in the United States. **Methods**: The authors administered surveys to these students and conducted 175 in-depth interviews. **Results**: Of the study participants, 34% reported the illegal use of ADHD stimulants. Most illegal users reported using ADHD stimulants primarily in periods of high academic stress and found them to reduce fatigue while increasing reading comprehension, interest, cognition, and memory. Furthermore, most had little information about the drug and found procurement to be both easy and stigma-free. **Conclusions**: This study supplies a rich understanding of the growing national trend of illegal ADHD stimulant use. The authors discuss strategies for stemming the tide of ADHD stimulant use.

Keywords: Adderall, ADHD, college students, prescription drug abuse, stimulants

The rise in the number of diagnoses and subsequent treatment of American children with Attention Deficit Hyperactivity Disorder (ADHD) has been well documented since the mid-1990s.[1–5] According to the Centers for Disease Control and Prevention,[6] more than 4.4 million children aged 4 to 17 years—a national prevalence rate of 7.8%—have been diagnosed with ADHD. Of these, doctors have prescribed stimulants to 2.5 million to treat the disorder.[6]

Adderall (mixed salts amphetamine), Ritalin (methylphenidate), and Dexedrine (dextroamphetamine) are considered first-line pharmacotherapy for ADHD, with Adderall being the most widely prescribed of the 3. Because of the potential for abuse and psychological and physical dependency, the US Drug Enforcement Administration (DEA) classifies these stimulants as Schedule II substances.[7]

In recent years, researchers have begun investigating the illegal use of stimulants prescribed for the treatment of ADHD on American college campuses.[8–16] Estimates of the prevalence of use have tended to vary. McCabe et al[11] conducted a multisite study in which they surveyed 10,904 students at 119 nationally representative 4-year US colleges. They found that 4.1% of the students surveyed had used an illegal prescription stimulant in the past year and reported that illicit use was highest among (1) white fraternity members, (2) students from the US Northeast, and (3) students from colleges with more competitive admission standards. They also found that nonmedical prescription stimulant users were more likely to report use of alcohol, cigarettes, cocaine, marijuana, and ecstasy, along with other high-risk behavior.[11]

Other investigations of the prevalence of illegal prescription stimulant use have yielded values higher than those found by McCabe et al.[11] For instance, Babcock and Byrne[8] found that 16% of their sample used Ritalin (methylphenidate) recreationally. Hall et al[9] reported a sex difference, in that 17% of college men and 11% of college women surveyed illicitly used stimulant medication. Furthermore, while examining the use of amphetamines in a convenience sample of college students, Low and Gendaszek[10] found a prevalence rate of 35.5%.

Exploring the issues of ethnicity and motivation, Teter et al[15] asserted that white and Latino college students were more likely to use prescription stimulants illegally than were African American and Asian students. They also found that the majority of students who used illegal prescription stimulants, regardless of ethnicity, did so to enhance their

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academic performances. Sixty-five percent reported using these drugs to aid concentration, 59.8% to help study, and 47.5% to increase alertness. Other motives not associated with academic performance included getting high (31.0%) and experimentation (29.9%).

Although these data provide some understanding of the prevalence of stimulant abuse and basic answers as to why students use these substances, they stop short of supplying an in-depth description of users' behaviors, conceptions, and choices, which can be mined only through qualitative methods. Thus, we investigated how and why college students at an American public university use illicit prescription stimulants. We examined (1) factors that led to first use of prescription ADHD medications, (2) motives for continued use of these medications, and (3) where and how students access these medications.

METHODS

We used both quantitative surveys and in-depth qualitative interviews. The university's institutional review board's human subjects committee approved all quantitative and qualitative methods for the current study.

Quantitative Surveys

Survey data collection occurred in 2 waves. In part 1, we administered the surveys to a convenience sample of 1,340 students enrolled in a large, lecture-hall, introductory communication theory class, over the course of 3 semesters (fall 2005, spring 2006, and fall 2006). This class meets the university's social science requirement; thus, it provides a sample of students from a multitude of majors from across campus. Given that students who take the course are disproportionately freshmen or sophomores, we made additional efforts to survey upperclass students. Thus, in part 2 of survey data collection, we administered an additional 471 surveys to convenience samples in upper-division (n = 188) communication classrooms, and paid undergraduate research assistants administered surveys to the general student body outside of the classroom (n = 283). These assistants administered surveys to upper-division students at popular places on campus (eg, libraries, dining halls, Greek houses). The undergraduates had completed an upper-division research methods class and were certified by the university's institutional review board.

We designed and pretested the 25-item survey for this study. We revised question wording and survey structure after conducting a pilot study of 94 students and receiving their feedback. The first 9 questions obtained basic demographic information. Two questions inquired about respondents' awareness of others' use of nonprescribed stimulant medication and whether they had ever personally used a prescription stimulant. Nine questions inquired about the details, perceptions, and reasons for personal use. Five questions inquired about other drug and alcohol use.

In part 1 of survey data collection, we entered the lecture hall at the beginning of class and described the study. We explained that participating in the study was completely voluntary and would amount to an educational experience. We then obtained informed consent from students interested in participating, handed out the surveys, and asked students to complete them. On average, students took approximately 7 minutes to complete the survey. In part 2 of data collection, we handed out surveys in upper-division communication classes, and 6 trained upper-division undergraduates handed out surveys to fellow students. We followed the previously described procedure.

The final sample consisted of 1,811 students: 45% male and 55% female, 92% white, 4% African American, 1% Asian/Pacific Islander, 1% Latino, and 2% other race/multiracial. More than one-third (37%) of the sample were freshmen, 27% sophomores, 19% juniors, and 17% seniors; 44% were members of Greek organizations. These demographics roughly mirror campus figures, which are 47% male and 53% female, 82% white, 6% African American, 2% Asian/Pacific Islander, 1% Latino, and 9% other race/multiracial. Campus figures also indicate that 28% are freshmen, 21% sophomores, 21% juniors, and 30% seniors; 18% are members of Greek organizations.

Qualitative Interviews

During spring and summer 2006, we interviewed an additional 175 full-time undergraduates using handheld audio tape recorders. Along with the primary author (AD), 6 paid undergraduate students also conducted interviews. The undergraduate interviewers had all completed an upper-division research methods class and were certified by the university's institutional review board. In addition, we trained and supervised the undergraduate interviewers in interviewing procedures, ethical guidelines, and transcription protocol. We gave each undergraduate interviewer a detailed script to follow; they obtained written consent before each interview.

We strategically selected the undergraduate interviewers to facilitate the comfort and trust levels of the undergraduates being interviewed. We assigned interviewers specific demographic segments of the campus population to interview based on comfort and fit with these groups. For instance, women interviewed female students and men interviewed male students.

Last, during the transcription stage, we changed all names and replaced them with arbitrary pseudonyms to protect interviewees' privacy. Furthermore, we either changed or deleted from the transcription record any identifying markers or references to people, organizations, or events that could jeopardize participants' anonymity.

RESULTS

Survey Overview of Adderall Users

Of the 1,811 students who completed the surveys, 4% (78) reported having a legal prescription for an ADHD medication, and as such, we removed them from the dataset. However, 34% (585 of the remaining 1,733) had used ADHD medications illegally. Of these 585, 49% were men and 51% were women. Most (94%) illicit users were white

students; the remainder were African American (3%) and other/multiracial (3%) students. In addition, 22% were freshman, 25% sophomores, 28% juniors, and 25% seniors. Last, 61% of illegal users were in fraternities or sororities.

To estimate the proportion of individuals who used Adderall by demographic category, we divided the number of users in each category by the total number surveyed (excluding individuals with legal prescriptions). For instance, we surveyed 708 men. Of these, 278 (39%) reported illicitly using prescription ADHD stimulants and 430 (61%) had not used. We also surveyed 895 women, of whom 266 (30%) reported using and 629 (70%) reported not using. Table 1 displays the results by demographic categories, including sex, race, year in school, and Greek status. In this table, we cross-tabulated stimulant use and nonuse by these same demographic factors and conducted chi-square analyses to examine statistically significant differences. The resulting data suggest that illicit use of ADHD prescription medications was significantly more common in men, white students, upperclassmen, and Greek members (versus non-Greeks). These subgroup differences are consistent with previous research.[11]

First-Time Use

Of the illegal users in our study, 63% (n = 368) first used nonprescribed stimulants in college. Such statistics, however, can tell us only so much about first-time use. With the augmentation of qualitative interviews, we were able to investigate what factors led to their first use of illegal stimulants and what type of early information about the advantages and risks of stimulants were provided to them.

The first thing that became evident during the course of our interviews was how prevalent the use and casual discussion of stimulants were on the college campus. First-time users did not need to seek out or discover information about the drug; ADHD stimulants were a salient part of their university culture. Jill remembers, for instance, how "everyone was taking it" in the dorms her freshman year. "It was just normal, you know, common." When we asked Lauren, a second-year accounting major, how she first heard of stimulants, she similarly told us that after arriving on campus, "everyone was talking about it, so it became no big deal."

Although discussions about ADHD drugs may have been both omnipresent and casual on campus, the first-time use of stimulants for most of the students in our study was almost always accompanied by periods of high academic stress and anxiety. It was, as Maggie claimed, "an emergency. I was stressed, overwhelmed, exhausted because I had to do a lot and there was no way I could do it. So I decided to see if it was like what everyone was saying." For John, a junior architecture major, it was the anxiety produced by his "first big project that had to be completed by the morning" that "pushed him over the edge. . . . There was just no other choice."

More than two-thirds of our interviewees, however, said the pressure-filled nature of finals created the ideal situation for illegal stimulant use. "My first time was during my freshman finals," Joe said. "I had a lot of pressure to do well, and I just felt like I needed help." It was also "first semester during finals week" for Lisa when she made the decision to try Adderall. "I had to cram for a really big test that next day. Pressure makes you do things like that."

Although everyone we spoke with acknowledged the stress of finals, many reported that it was not just end-of-the-year test taking that drove them to try stimulants but having to take multiple final exams on the same day. This combination seemed to create a perfect storm in which stress and exhaustion collided with students' desperation. "I didn't want to try it. I was even a little scared," remembered Jackie. "But I had 2 other tests besides that one [her biology exam], so it was 3 tests on 1 day." Similarly, Brian's first use came on the eve of 2 business exams. "There was just no way I was gonna pull it out. I just could not focus. It saved me. Still does."

The most disturbing aspect of these students' first-time use was how little information they had about stimulants before trying them. In almost all cases, the only knowledge these students had about ADHD medication was what they had heard from other students. John told us that he heard from his fraternity brothers that it was a "miracle" and a "study drug." Janet was told by her roommates that "it keeps you awake all night long and makes you not hungry." For Alan, Martin, and Chris, it was the repeated testimony from friends who "loved it," "did well on tests on it," and "got better grades" because of it. None of the 175 people we interviewed, however, sought out information from health professionals, medical or pharmaceutical reference guides, or even Internet sites before taking their first dose.

Motivations for Taking Illegal ADHD Medications

Academic Motives

Unlike most other illegal substances that these college students took, they did not use stimulants primarily for social or entertainment purposes. Although respondents told us that alcohol, marijuana, prescription barbiturates, and cocaine were used almost exclusively to "get high" and to "have fun," ADHD medications were used predominantly for the more serious pursuit of "getting good grades."

Of the students who reported using illicit stimulants, 72% (n = 420) reported doing so to stay awake to study longer (see Table 2). "If I procrastinate," explained Peter, a junior agriculture, economics major, "then it helps me cram. If I need to stay up all night, then I kind of need it." For Jason, procrastination was not the problem: it was finals. "They suck. That's the only time I take it. Every year during finals week. But I don't usually take it during the semester when my tests are spread out."

The students' use of amphetamines to stay awake, although disturbing, was not surprising. Fighting fatigue and increasing energy levels are the most obvious and well-known effects of stimulants. As Justin told us, "That's why they call it speed." What did surprise us, however, were the illicit users who touted ADHD medications for their ability to help them focus on academic tasks.

TABLE 1. Illicit Use of Prescription ADHD Medications in Various Demographic Subgroups

	Using		Not using	
Demographic	*n*	%	*n*	%
Overall	585	34	1,148	66
Sex***				
Male	278	39	430	61
Female	266	30	629	70
Race*				
White/Caucasian	547	35	1,032	65
Other race/ethnicity	34	25	101	75
Year in school***				
Freshman	101	18	473	82
Sophomore	127	31	288	69
Junior	144	49	150	51
Senior	137	55	112	45
Greek status***				
No	228	23	747	77
Yes	357	48	389	52

Note. ADHD = attention deficit hyperactivity disorder.
*$p < .05$. **$p < .01$. ***$p < .001$.

TABLE 2. Reasons for Illegal Use of Prescription ADHD Medications (*N* = 585)

Reason for use	*n*	%
To stay awake to study	420	72
To concentrate on your work	389	66
To help memorize	213	36
To stay awake and have fun	127	22
To make work more interesting	70	12
For the high (the good feeling)	39	7
To suppress your appetite	32	5
To self-medicate your ADHD	22	4
Other	10	2

Note. ADHD = attention deficit hyperactivity disorder.

Of the 585 students who reported using illicit stimulants, 66% (n = 389) reported taking them "to help concentrate" on school work. After analyzing the interviews, however, we discovered that, below the surface of these statistical data, the students' conception of concentrating had multiple and layered meanings. Specifically, these students claimed that they could study longer, stay focused without distraction, and be more productive.

For many in our study, the most important aspect of concentrating was the ability to study for longer periods of time. Chris, for example, told us he "can stay focused for a lot longer. Instead of going for 45 minutes and getting distracted, I can study for 3 straight or 4 straight hours." Lauren, who said she was easily distracted, claimed she could "work and read for 5 hours straight without a break. I normally can't make it more than a half an hour without it [Adderall]." Even more remarkable, Brad "swears" he is able to "focus 10 times more. . . . instead of just reading a little part, I can sit down and actually read you know, a lot of pages of a book. Like 50 to 60 pages of a book instead of reading 2 pages."

For others in our study, the motivation for taking Adderall was not necessarily their ability to study for longer periods of time but their ability to focus on a single task without distraction. For example, John said he took Adderall because he believed "it blocks out outside noise. I personally pick up on everything: distractions, you know, and things like that. So for me, it's about focus and concentration." "For me," remarked Tara, "it just zones me in to what I'm doing. It zones me out to all the outside noises around me. It's incredible."

Most of the students we interviewed also claimed that stimulants made them more productive. For Nancy, this

was her primary motivation for stimulant use. "I get everything done, quickly. I am crazy on it that way. I can have so much work to do, and I can just sail through it." Similarly, Cameron explained that he is "so much more productive. I mean, I'm generally productive. It's just a different level on Adderall."

The most interesting, and unexpected, advantage that led students to use stimulants was not productivity but increased intelligence and heightened cognitive aptitude. As Mitch simply but succinctly remarked, "The stuff is like an academic anabolic steroid." This effect can best be understood as the enhanced ability to memorize, grasp ideas, and recall information.

For 36% (n = 213) of stimulant users in our study, "being smarter" was equated with a heightened facility to memorize and retain information. "Normally, I'm slow," explained Josie, "but on Adderall I can memorize anything. It just goes in, and you got it." Similarly, John, a junior history major, told us of an exam where he "had to memorize, like, over 10 essays." Without stimulants, "there is no way I could do it," he said. "But it was just easy. I read it and I got it. It was crazy."

For others, like Justin, a senior economics major, the belief is that stimulants dramatically increase the ability to "grasp ideas" that would "normally be too hard to get." He told us that "stuff just registers better" when he is on it. "Reading or trying to figure out problems, it just comes easier." Neil also reported a noticeable difference in "grasping ideas." "I can tell the difference," he explains, "between when I am on it or not. I grasp everything so much easier. . . I feel like a genius on it."

And still for others, like Caroline, the ability to "recall information quicker" is the primary cognitive advantage of stimulants. "Information just comes to me," she said, "in a really easy way. I don't have to search for it. I memorize it once, and it is there." In a similar vein, Nathan told us that he can better recall information during tests. "I feel like I get finished with it quicker" because "it's automatic, like, I recall things quicker." During his ACT, for example, Nathan was "able to zoom through it. I remembered everything that I think I would have forgotten."

Last, 12% (n = 70) of users reported taking stimulants to "make academic work more interesting." As Scott, a sophomore sociology major, told us, academics can be boring, but, "You pop that pill and that is all, you are really into that subject." For Andrea, stimulants make work enjoyable. "It was about a week ago on a Sunday," she described, "and I had a lot of work to do and was really stressed." After taking 20 milligrams of a stimulant, however, "work just became really fun, enjoyable. I actually enjoyed going to the library on it."

In summary, our survey data showed that the students' primary motive for taking ADHD medications was to earn better grades in school. With the augmentation of our qualitative data, we discovered a myriad of more subtle motives defining when and why these students take stimulants. We know, for instance, that participants who took stimulants did so primarily during finals week or during periods of high academic stress. We also know that these same students took stimulants (in order of importance) to stay awake, concentrate (eg, focus longer, avoid distraction, be more productive), increase cognitive aptitude (eg, aid memorization, comprehension, recall), and make study material more engaging. But academic improvement was not the only motive for stimulant abuse. In the following section, we discuss the nonacademic motives for taking ADHD medications.

Nonacademic Motives

It is clear from both our quantitative and qualitative data that students primarily use stimulants to earn better grades and to do better in school. At times, however, these students turned to stimulants for recreational purposes. Of the 585 students who reported using illicit stimulants, 7% (n = 39) also reported taking them to have fun. Inside these numbers, however, our interviewees detailed several ways that students used stimulants to promote their idea of fun.

The primary social advantage for stimulant use is the additional energy it supplies to the users. "If you have a big night," explained Jake, "and you are tired, you just take Adderall and you are set to go all night." For John, it was "this big camping trip [I] took last semester, in the spring," that convinced him to use stimulants. "We all decided that we were going to drink all night and stay up until the sun rises, so we all just took, like, 25 milligrams of Adderall. It worked!" Stacy first decided to try Adderall on her prom night in high school. "I was 17, senior year, and everyone was gonna stay up all night after prom. So, some of us took it. It was a pretty cool night."

Along with staying awake, users said stimulants made them more social and talkative during their marathon party sessions. Kevin, who said he is "naturally a little shy," believed he is "just funner and funnier." He continued, "I am really good, or at least I think I am, when I am on it. I can really talk. People think I am funny on it." Caroline had a similar feeling. "I go out, and I am really outgoing. I am set to go. I can just go up to anybody and start conversations. And they are good ones. Not the drunken kind."

Others sought the effects associated with combining alcohol and stimulants. Interestingly, our interviewees could not agree on what specifically happens when you combine alcohol and stimulants. Rebecca said, for instance, that "people take it before they drink because it doesn't get you as drunk. So you can drink more over a long period of time and not get ridiculous." Many people we spoke with, however, claimed that "the best thing about it [stimulants] is that it gets you drunker" (Mason, sophomore business major). Francis told us that since high school, she and her friends take it before they "drink because it gets you drunker, or at least that is what we think." Cam, who also liked having the extra energy, articulated this same advantage. "So, it is like this: we take it before we drink because we get drunker quicker, and you can go forever. It's like 2 for 1."

Some in our study, however, preferred the unaltered effects of stimulants. Seven percent (n = 39) of users reported taking stimulants because they are a cheap, easily accessible high. "It's such a new craze," Brad said. "I don't know if it is going to spread like pain killers, but people are snorting it like coke." "The best way to do it," Keith explained, "is to mash it up. It [Adderall capsules] is time released, and if you mash it up, you get it all at once, like a rush. So you snort it." "The best thing," Matthew said, "is that it is cheap coke. You know you get that same high, but you can get it for like 5 bucks."

A disproportionate number of women in this study touted stimulants for their ability to suppress appetite. For some women in our study, the loss of appetite was simply a beneficial side effect of stimulants. Nancy, for instance, told us that although she only took Adderall to study, "It is kind of cool that you also don't want to eat either." For other women in our study, however, suppressing appetite was the primary motive for stimulant use. "The first time I used it," Brenda said, "was because one of my sorority sisters told me how great it was. She said you don't want to eat, and it is safe and everything." Like the use of stimulants for academic reasons, however, most of the women said they were strategic about when and why they use ADHD medications for weight loss. "Spring break is a big one," explained Jackie. "Most of the girls in my sorority will use it before spring break so they look thin—special occasions like that." Fraternity formal gatherings were another recurring event inviting extreme dieting in many sorority houses. Said one respondent: "Sometimes you need a little help. You put on a little weight, and you know you have to get in a tight dress. It really takes your hunger away for a few days. I don't use it all the time though, no. But sometimes, you have no choice."

Thus, for many participants, they also use stimulants for purposes other than academics. These students found great utility, for instance, in stimulants' ability to fight fatigue (especially during extended periods of partying), increase sociability, heighten the effects of alcohol, decrease the depressant qualities of alcohol, simulate cocaine, and suppress appetite. The obvious question left unanswered is, how do so many students obtain such a popular, versatile, and highly controlled narcotic?

Obtaining Illegal Stimulants

The DEA classifies the ADHD medicines we investigated as Schedule II drugs because of their high potential for abuse and risk of severe psychological and physical dependence.[17] Because of this, Adderall, Ritalin, and Dexedrine are legally available only through prescription, with a limit of 30 days' worth of doses and no refills. In addition, Schedule II drugs are subject to DEA production quotas. Other often-discussed Schedule II drugs include cocaine (used as a topical anesthetic), morphine, phencyclidine (PCP), short-acting barbiturates, injectable methamphetamine, and most pure opioid agonists, such as opium and OxyContin.[12]

For most of the students in our study, however, the DEA's Schedule II classification means little. As Mark, a senior marketing major, claims, "The stuff is everywhere. Just ask anybody, and they will either have it or know somebody that has it. It's really no biggie." And Mark is not alone in his sentiments. When asked how difficult it is to obtain illegal stimulants, 39% (n = 231) reported that it was "very easy," 43% (n = 250) thought it was "somewhat easy," 13% (n = 76) claimed it was "somewhat difficult," and less than 1% claimed (n = 3) it was "very difficult."

Disturbed that nearly 85% of our 1,811 participants thought obtaining illicit stimulants was either very or somewhat easy, we sought a richer understanding of these numbers. We asked participants to expand on where they get their drugs and what procedures are involved in their procurement.

We discovered that the students in this study did not get their stimulants from drug dealers standing on street corners. Instead, 89% (n = 521) of users said they got substances from friends (87%) or significant others (4%); 8% (n = 44) said they procured stimulants from strangers or, as Leslie more aptly defined them, "friends of friends." Only 4% (n = 78) in our overall sample reported having a prescription from a doctor to treat their diagnosed ADHD. Apparently, this 4% is also the primar distribution source for 34% of the general student population and 48% of the Greek population.

So where is this 4% found? According to Margaret, "They seem to be everywhere. Somebody that you know personally has a prescription. It's not like they hide it. Everyone knows. It's cool." Said Beth, "I think everyone knows a few people with it. Today it seems like everyone is ADHD, aren't they? Everybody is medicated on something." Jeremy told us, "You know which of your friends have it; people aren't really discreet that they have it. They become famous."

For members of sororities and fraternities, accessing these stimulants is even more effortless. Although 46% reported that obtaining prescription stimulants was somewhat easy and 43% claimed it was very easy, only 2 of the sorority and fraternity members surveyed reported that obtaining prescription stimulants was very difficult. "In our house, there is always a few brothers with it. So we really turn to them, especially during finals," one fraternity member said. "They are really good about hooking us up first. It's easy. Except during finals when we all want it." Lauren, a member of the Omegas, told us that in her house, "there are 2 sisters that are really great about helping us. They will always give us their extras." The close proximity, according to Abby, is the key. "You are always there, so you just ask somebody. At dinner or just walking through the rooms. If you can't find any, there is always somebody around that knows somebody, in a fraternity or somewhere."

For those without such bonds, there is always the university's library, the seeming epicenter for stimulant drug distribution. What makes this site so ideal is that it has open "core areas" ergonomically designed to facilitate human interaction. Most importantly, participants collec-

tively defined the library as the open and safe site for obtaining ADHD medications. "You probably look for it at the library," answered Brittney when asked where to find stimulants. "Believe it or not, that's probably the hot spot. You go to the library if you want Adderall, 'cause that is where it is." Supplying more detail, Christi claimed that "literally, each core of the library will have 2 or 3 people that have it. Literally, each core. Like, core 1 through 4 will have, like, 3 people with it. It really is kind of funny."

With such a high demand for the product and its restrictive Schedule II classification, one may assume that acquiring these stimulants would be expensive. It is not. Approximately 15% of the people we interviewed, in fact, said they got their stimulants for free from close friends with prescriptions.

For paying customers, the going rate ranges from $3 to $10 per pill. William, a junior who often sells his prescribed surplus, has created his own pricing method. "I have 30 milligrams. My going rate is $1 for every 5 milligrams. So I sell them for usually $6." Robert, another seller, prices Adderall at "10s [milligrams] for $3, 20s for $4, and $5 for the big 30s." Buyer Caroline simply pays a flat rate of $5: "I don't normally worry about the milligrams."

Most buyers and sellers, however, agreed that stimulant sales are not about the money. Although there are a few exceptions, like Mark, who fills his prescription each month and sells "the whole bottle for $100 to $150," most buyers perceive, and sellers claim, to do it as a service for their friends. As buyer Charles saw it, "I think they do it just to be good guys. I mean, come on, what's a few bucks?" Seller Abraham explained his situation this way: "I don't charge to make money, really. But I charge $5 or so because of the inconvenience that it causes me."

But how and why do these diagnosed ADHD students have surplus pills for sale if these stimulants are so highly regulated? The answer, as Patrick told us, is because "no one takes it everyday. That would kill your system and really screws up your body." Similarly, Katie told us that she "does not think it is smart to put that sort of chemical in your body every day." Some of the more common side effects that users mentioned include the inability to sleep, sweating, increased heart rate, loss of appetite, and, for some men, the inability to get an erection. "To take it every day," explained David, "would really mess you up. You would never eat or sleep well. You just can't do it, really."

Thus, every student with a prescription that we spoke with was strategic about their stimulant use. Many, for example, never took their medication on weekends. Others took it only on the days they had classes. Still others took it only when their workload demanded a heightened level of attention and concentration. Gena, a diagnosed ADHD student, explains her decision-making process: "I don't need it every day. You don't need them on the weekends. Or maybe you might need it on a Sunday but not on a Friday. So you always have extra to give to friends if they need them."

For most prescribed students, therefore, having surplus stimulants at the end of each month is common. Selling their leftovers is simply seen as a morally inconsequential win/win decision. As James framed it, "What am I going to do with all those pills? So I figure, if I can help out some friends and make some beer money, life is good."

COMMENT

We wanted to gain a broader understanding of college students' illicit ADHD stimulant use using quantitative and qualitative methods. The quantitative data suggest that the overall rate of use was 34%, which is higher than rates found in previous studies.[8,10,11] Although our sample was in many ways one of convenience, as reported in the Methods section, it is somewhat representative of the campus as a whole because of the surveying of an introductory class that a broad cross-section of students take. Thus, we found at least 3 possible explanations for the higher overall rate of use found in this study. First, ADHD stimulant use may be rising nationwide as time passes and this phenomenon continues to grow. Rates of use may vary on different college campuses, and this campus may have had higher prevalence rates. In fact, the state in which the current study took place has been ranked as 1 of the top 3 states in the United States for ADHD diagnosis, which may contribute to higher prevalence rates.[18] Last, the relatively high proportion of Greek students in our study may have contributed to the higher prevalence rates.

In addition to basic statistical data on use, user demographics, and motivations for use, we also aimed to obtain a richer understanding of illegal stimulant use through qualitative methodologies, an approach that has been neglected in previous research. Through the augmentation of 175 in-depth interviews, we discovered, for example, that most users possessed limited knowledge of prescription stimulants, appropriate doses, physiological or psychological side effects, or legal consequences of illicit use. We also found that first-time use almost exclusively took place during periods of heightened academic stress. In particular, participants reported that finals week produced a context of anxiety and desperation that made students exceptionally vulnerable to the highly publicized promises of stimulants. In addition, most students reported that procuring illegal stimulants was easy and unobtrusive. In interview after interview, students told us not only how stimulants had become part of the campus culture—being openly and positively discussed in public settings—but also how, as Robert, an undeclared freshman, said, "Anybody really can get it just about anytime they want it. It is easier than beer to get."

The qualitative data also reveal a general perception among illegal users that consumption of nonprescribed ADHD medications enhanced cognitive abilities. Some interviewees' statements almost advertise this prescription drug misuse as a miracle for any student striving for academic success. We, however, did not attempt to measure whether prescription stimulants actually improved non-ADHD students' abilities in the classroom. The proliferation of research examining how ADHD medications affect

cognitive functioning focuses on individuals diagnosed with ADHD; thus, we know little about how these medications actually work on a physiological level among non-ADHD users.[19–22] Future researchers should investigate these claims of enhanced cognitive aptitude to better understand and assess such claims.

Perhaps the most disturbing finding from our qualitative investigation was students' general lack of guilt or dissonance over taking illegal stimulants. Most viewed its use as not only physically and psychologically harmless, but also morally acceptable, because it was used for academic purposes and not for social entertainment. "We're not getting high off it," explained Nancy, "we are doing it to do better in school. So, no, I don't feel bad or anything." The fact that these stimulants are also prescribed pharmaceuticals that can be purchased at any local pharmacy and not street drugs sold by felonious drug dealers also supplies moral solace to many users. In short, the illegal use of ADHD medication seems to be stigma free for the overwhelming majority of our participants. This finding does not bode well for traditional intervention efforts.

There were a number of limitations of this study that should be taken into account when interpreting the results. As discussed throughout this paper, the quantitative sample was a convenience sample that exhibited many characteristics of the campus as a whole; however, given that it is a convenience sample, there is no guarantee that it represents the population from which it was drawn. Our sample also appeared to include more Greek students than the campus population as a whole. Moreover, all data came from 1 large public university in the southeast region of the United States, and researchers have found that stimulant use varies according to factors such as region of the country and school competitiveness.[11] Thus, the rates of stimulant use we found may be different than those at other universities, and the reasons for use and issues related to access of stimulants may also differ.

Implications for Interventions and Campaigns

What can be done to stem the tide of this growing problem of ADHD stimulant use on college campuses? Our findings illuminate at least 3 possible answers to this question. The first, and perhaps most efficient, answer is to target the student suppliers of the stimulants. Given that only a small segment of college students have legal prescriptions for ADHD medications but apparently supply the entire campus with these stimulants, focusing on this small group may be an efficient intervention strategy. We discovered that prescribed users almost never take their ADHD medication every day. Many reported taking their medication only on heavy workdays, days when they have classes, or weekdays. Thus, at the end of each month, most prescribed users have a surplus of stimulants that become the basis for illegal exchanges on campus. The medical community, therefore, may consider limiting the monthly allotment of pills to 20—except in cases where patients can clearly show the need for daily use.

The need for educating the illegal consumers of ADHD stimulants must also be part of any intervention strategy. As our qualitative data highlighted, these individuals have a dearth of salient information regarding the physical and psychological dangers of stimulant use and even less information about the legal ramifications of obtaining a Schedule II controlled substance. Many were surprised that it was a crime. Mass communication campaigns across a variety of health behaviors have been successful in improving various health knowledge, attitudes, and behaviors.[23,24] In addition, administrators may consider campus-wide campaigns that educate the student population about the health risks and legal penalties associated with illegal stimulant use. Existing structures such as freshman orientation programs, campus speaker series, and classroom discussions incorporated in appropriate curricula (eg, chemistry, biology, psychology classes) could be used to educate students about the dangers of these prescription drugs.

Last, college and university leaders may consider reducing the demands placed on students during finals week. As discussed earlier, an overwhelming majority of illegal users claimed to have started, and continue to use, during their highly stressful finals week. They reported that the amount of work that is asked from them in such a limited time frame necessitates the use of illegal stimulants. Thus, extending finals over a 2-week period or managing student schedules to guarantee that only one final can be taken per day may help reduce the contextual factors that give rise to illicit stimulant use.

The biggest barrier to prevention efforts, however, may be the professed effectiveness of the drug itself. Almost all participants claimed that ADHD medications were highly effective in increasing their attention span, making work more interesting, improving their cognitive abilities, and fighting fatigue. With the multifaceted demands placed on college students (eg, grades, social life, finances) and the increasingly competitive workforce that awaits them after graduation, these students believe they have found the "magic bullet." "It works!" explained Lisa, a senior premed major. "Why wouldn't you use it if it works? The stuff is great. Great!" We are left to wonder, therefore, how to persuade students not to take stimulants that are so soundly praised for their effectiveness in a culture that increasingly justifies the means by the ends.

NOTE

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