Methylphenidate Use in College Students

By: Mandeep Shergill

Methylphenidate is a medication prescribed to sufferers of attention deficient disorder (ADD), and attention-deficit hyperactivity disorder (ADHD). It is predominantly used in the treatment of this condition in children and more than 8 million American adult ADHD sufferers ²⁸. It is also used to treat some cases of narcolepsy in adults. The most commonly available prescribed form is methylphenidate hydrochloride, more commonly known by the brand-name Ritalin, or by its street names “Rids, Pineapple, Uppers, Vitamin R, Jif, RBall, [and] Smart Drug” ⁶⁰.

Methylphenidate works by stimulating the central nervous system. It has effects similar to caffeine and amphetamines, and its potency falls somewhere between the two ²⁰.

Research at Brookhaven National Laboratory ² indicates that administering normal doses of methylphenidate to healthy, adult men increases levels of the neurotransmitter dopamine, which provides “feelings of enjoyment and reinforcement to motivate us to do, or continue doing, certain activities [and] ... is released ... by naturally-rewarding experiences such as food, sex, use of certain drugs” ³²; thus increasing an individual’s ability to focus on a task by making it seem more interesting.

Methylphenidate actually accomplishes this ²² by inhibiting the re-uptake of dopamine by blocking molecules that transport dopamine away from nerve endings, permitting more dopamine to actually reach the dopamine reward receptors in neurons ²⁴. The net result for those who may have an excess of dopamine transporters – such as ADHD sufferers – is the improvement of attention and focus to levels that match the general population.

Methylphenidate’s stimulant properties however, have also lead to its abuse and reports of non-prescribed use of the drug Ritalin have increased ²⁰, notably among college-age students ⁴. Abuse of Ritalin occurs when it is taken by an individual who was not prescribed it – which is illegal, when it is taken at a higher dose than normally prescribed, or if the drug is taken in a way not prescribed, i.e. not taken orally in tablet form. According to Kelly Burch-Ragan, president of the International Association of Addictions and Offender Counselors (a division of ACA), "Ritalin is a stimulant, but for those with ADHD, it has a calming effect. Those not diagnosed with ADHD experience the stimulant-related physical and psychological effects of the drug" ⁴.

These stimulant effects include appetite suppression, extended wakefulness, increased focus/attentiveness, ⁴ and euphoria. These effects have led to three primary forms of misuse of Ritalin: as a weight-loss solution, as a recreational drug, and as a performance enhancer for all-night study – all of which raise ethical concerns. In a study conducted at McGill University in 2005 ¹³, 30% of surveyed students reported using methylphenidate solely for studying purposes, while 70% reported recreational use of methylphenidate, which also included students who abused Ritalin both recreationally as well as for a study aid. As no distinction was made between these individuals in the
study, the 30% figure is no doubt higher than reported and the ethicality of such abuse will be discussed later in this paper.

According to Mark Freeman, president of the American College Association, "They [students] are definitely using and abusing it". He further notes that because more students are being prescribed Ritalin, it has become more accessible to those who want to abuse it. Although Ritalin is one of the top controlled prescription drugs stolen in the United States according to the Drug Enforcement Agency (DEA), abusers usually obtain Ritalin from friends with valid prescriptions who are willing to give away, or sell part of their supply. Moreover, it is not only procrastinators using Ritalin to achieve high grades, but also the good students struggling to keep up with the demands of full-time work and intense academic competition.

Ritalin is administered orally in tablet form, and most abuse of Ritalin as a study aid mirrors this delivery method. The tablets can also be crushed and snorted. Some users even go as far as to dissolve the tablets in water and inject the mixture. As these delivery methods are unintended by the manufacturers, they can cause consequences such as an increase in the severity of unwanted side-effects, or in more extreme cases, even result in death.

There is no such limitation of risk when methylphenidate is used in quantities that exceed prescription guidelines, or when it is delivered in ways that accelerate uptake. Severe complications can arise when Ritalin is injected as the fillers contained in the Ritalin pill, such as talcum which is not water-soluble, may lead to infected sores at the injection site, as well as blocked small blood vessels resulting in lung and retina damage. Individuals who use Ritalin without a prescription may experience an increased heart rate and elevated blood pressure. This is exacerbated by non-standard delivery methods such as snorting and injection.

Other side effects include insomnia, loss of appetite, nervousness, irritability, nausea, headaches, heart palpitations, hypersensitivity, and toxic psychosis. Additional serious side effects such as paranoia and hostility, psychotic episodes, seizures and an irregular heart beat that can cause sudden death may result if too a high dose is taken or if Ritalin interacts negatively with another drug in the body. Other non life threatening side effects include repetition of movements and meaningless tasks, and formication – the sensation that ants or other insects are crawling on or under the skin.

Following a course of methylphenidate that is prescribed and monitored by a healthcare professional however, greatly reduces the risk of becoming addicted to it. As it is the speed at which Ritalin gets into the brain leading to increases in dopamine that determines how addictive Ritalin is, taking Ritalin orally in its prescribed amount and form – as a pill – does not lead to addiction since it takes at least one hour for dopamine levels to raise in the brain after administration. This therapeutic effect is achieved by slow and steady increases of dopamine, replicating the natural production of dopamine by the brain. Therapeutic dosage of Ritalin begins at 5 to 10 mg, one to three times a day, with an average dose of 20 to 30 mg daily but does not exceed 60 mg daily for children over six and even in adults.
Heavily dependent recreational users on the other hand, may take hundreds of milligrams of methylphenidate per day, increasing the dosage as they build a tolerance to the desired effects. Methylphenidate, when taken intravenously, reaches peak concentration in the brain approximately 9 minutes after injection, and the resultant induction of large and fast dopamine increases in the brain is more likely to result in addiction.

Cocaine, another dopamine reuptake inhibitor that is highly addictive and is very similar chemically to Ritalin, reaches the brain in 5 minutes when injected into the veins. In fact, clinical studies have shown that neither animals nor the human body can distinguish between cocaine or Ritalin as both produce nearly identical effects although “milligram per milligram, Ritalin is more potent than cocaine … [and] the effects of Ritalin last longer than cocaine.”

As a result, Ritalin is often referred to as “the poor man’s cocaine,” and as with other abused stimulants, methylphenidate abusers also suffer from withdrawal symptoms if the drug dosage is reduced or stopped suddenly. Withdrawal symptoms can include: exhaustion, severe emotional depression, apathy and paranoia, but the severity of the withdrawal depends on not only how much Ritalin the individual was addicted to, but also for how long.

Students rarely consider however, the long term effects of Ritalin abuse – in their minds, if the drug was not safe, why would the Food and Drug Administration (FDA) approve its use in millions of children? Until recently, it was believed that Ritalin’s side effects were only short-term. Gene expression research on animals at the University of Buffalo however, suggests this is not the case and that Ritalin “appears to initiate changes [similar to those caused by other stimulant drugs such as cocaine] in brain function that remain long after the therapeutic effects have dissipated.”

Formal and informal studies seem to indicate that illicit use of methylphenidate among college age students is on the rise. In a 2002 study of 2,200 students at an unnamed North American university, 3% admitted to Ritalin abuse in the previous year. Another study also conducted in 2002 at the University of Florida-Gainesville found that 1.5% of the student body had used Ritalin recreationally in the previous 30 days, while a survey of undergraduates at Bates College in Lewiston, Maine revealed 7% of its students admitted to taking Ritalin. According to an annual study conducted by the University of Michigan, nearly 5% of college students in 2003 said they had tried Ritalin without prescriptions in the previous 12 months. Furthermore, Ritalin abuse among college students was nearly twice that of non-students of the same age. The abuse of methylphenidates raises ethical issues for many groups.

Novartis, a pharmaceutical corporation who manufacturers methylphenidate under the brand name Ritalin, is now faced with the widespread unethical use of its product. Although Novartis argues that Ritalin is effective in helping millions of children manage their ADHD, it has also acknowledged the drug can be easily abused and has made efforts to educate doctors and pharmacies of “incidents of improper use and abuse.” While it would be tempting to pass responsibility to the end-user, the prescriber, or the legal enforcer, a more beneficial approach for society would be the commissioning of further studies into how and why the drugs are effective, as well as their effect on
unsuitable candidates – such as those who take their drugs illicitly or feign symptoms to obtain a valid prescription.

Physicians must be ever more careful of mis-diagnosis, especially as symptomatic information for disorders become more readily available to the public on the Internet. Using the Internet, students can easily research Ritalin as well which symptoms to feign in order to successfully elicit a diagnosis of ADHD. As one student at Boston University put it, "Just read a little bit about the symptoms of ADD, and walked in, and pretended I had ADD - just acted like a scatter-brain," he said. "Look around, wouldn't pay attention, stuff like that. And, you know, the doctor bought it." A recent UCLA study showed just how easily the four commonly used behavioural rating scales – the Wender Utah Rating Scale (WURS), the Conners Adult ADHD Self- Report of Symptoms (CAARS), the Brown Adult ADHD Scale (BAAS), and the ADHD Rating Scale (ARS) – which are used in the diagnosis of ADHD, are “significantly falsifiable”. Some campuses have already started to take steps in this direction by referring students seeking diagnosis of ADHD for a neuro-psych evaluation.

The local and federal government has ethical responsibilities in the dissemination of accurate information to the public. Providing balanced risk-benefit analyses of the legal use of methylphenidates as well as clear legal penalties associated with illicit use would make students take the issue more seriously and thereby reduce methylphenidate abuse in many cases.

Campus authorities also have an ethical duty to protect their students via the effective distribution of educational material on the risks of methylphenidate abuse. If abuse continues to spread in the face of such measures, they also have the option of inhibiting methylphenidate abuse by establishing testing routines not only to uncover abuse, but also to act as a deterrent to students. At a conference in New York in June on the ethics of cognitive enhancement, delegates suggested that future students may have to be dope-tested and asked to hand in a urine sample with their exam paper to prove their results were due to hard work and not pharmacology.

ADHD patients also face ethical questions. Methylphenidate has been verified as dangerous and even fatal when misused. This should be a consideration for those who supply prescription methylphenidate to third parties, whether on a trial basis or for a fee.

Ritalin is currently classified as a Schedule II drug, which means although it has accepted medical use, it also has high potential for abuse and addiction. As a schedule II drug, patients cannot get refills for Ritalin, and there are limitations in how much Ritalin can be prescribed per prescription.

Furthermore, there are serious legal ramifications for those supplying Schedule II drugs. The penalties for a first trafficking offence, which can be applied to a student for sharing just one or two pills with a friend, include five to 20 years in prison and a fine of up to $1 million. Selling or trading as part of a group incurs a fine of up to $5 million, and if death or serious injury results from this first offence, a penalty of 20 years to life in prison is applied. Furthermore, injection of the drug constitutes a Class A drug offence carrying even harsher penalties. While possession is not punished quite as harshly, where a first conviction may include 1 year in prison as well as a $1000 fine, it is still severe for a drug that many students light-heartedly think of as a valid study aid.
When methylphenidate is used by non-ADHD sufferers to improve academic performance, arguments and counter-arguments start flying. Opponents consider them ‘brain steroids’ that confer an unfair academic advantage to those who have access to them. Proponents maintain that they are no more unfair than private paid tuition. However, the issue of ethicality on the part of the non-ADHD user hinges on one major factor – whether or not methylphenidates actually improve academic performance.

According to Laurence Greenhill, a clinical psychiatrist at Columbia University, “[taking analeptics, i.e. central nervous system stimulants] won’t increase your intelligence, it just increases your diligence. Essentially (analectics only) delay the onset of sleep so you can stay up all night and cram.” Eric Heiligenstein, director of clinical psychiatry at the University of Wisconsin, believes that: "Caffeine is fine. This [Ritalin] is better. Students are able to accumulate more information in a shorter time. They minimise fatigue and help maintain a high performance level."

However, neither side sufficiently addresses another relevant issue – undiagnosed ADHD sufferers. While it would still be illegal for such an individual to take non-prescription methylphenidates, it would not be unethical as they would not be gaining a performance boost over and above that of a non-medicated non-sufferer. While this would only include a small sample of the student population and would be considered by many to be insufficient justification of illegal methylphenidate use in students, it is nevertheless an issue that must be considered by agencies attempting to curtail the use of Ritalin with blanket bans.

If the effect of methylphenidates on academic performance can be scientifically confirmed, it would lay this issue to rest. If methylphenidate offers no more academic benefit than provided by legal stimulants such as caffeine, then the ethicality of illicit Ritalin use by students would no longer be an issue, and if it does confer a measurable advantage, then it would be verified as unethical. Regardless, the legal ramifications of possession are clear and illegal use of a controlled substance is in itself unethical, and one punished severely by the law.

The following is a survey (survey 1) that was conducted at the Eugene Applebaum College of Pharmacy and Health Sciences November 28th to the 30th in 2005 to determine whether or not the researched problems (through online searches) truly do exist among college students today.

Survey 1

Methylphenidate Use in College Students

This survey is for an ethics paper and will be strictly ANONYMOUS so please do not put your name on it – THANK YOU! ☺

1. What is your gender? (Please circle one)
   a) Male
   b) Female

2. How old are you? (Please circle one)
   a) <18
b) 19-25  
c) 26-32  
d) 32-39  
e) 40-47  
f) >48  

3. Have you ever used anything to help you stay awake to study? (Please circle all that apply)  
a) Coffee  
b) Tea  
c) Red Bull  
d) Ritalin  
e) Coffee pills  
f) Other (please list)  

4. Have you ever taken methylphenidate (Ritalin) for studying? (Circle one)  
a) Yes → I have a prescription for it  
b) No → NEVER  
c) Yes → I got it from a friend  

PLEASE keep in mind that Methylphenidate (Ritalin) is a schedule II drug (highly abused and regulated) that is used to treat people with ADHD (attention deficit hyperactivity disorder) when answering the following questions:  

5. Should methylphenidate (Ritalin) be prescribed in individuals who have not been diagnosed with ADHD but whose grades and concentration would improve with its use? (Circle one and explain why you chose the answer you did)  
a) Yes →  
b) No →  

6. Do you feel that it is unethical for college students to be prescribed methylphenidate if they are less smart than the other students and could use the extra help? (Circle one and explain why you chose the answer you did)  
a) Yes →  
b) No →  

7. Since methylphenidate dramatically increases concentration in normal individuals would you ever use it to study? (Circle all that apply)  
a) Yes – If I was not going to get caught  
b) No – If I was going to get caught  
c) Yes – If I was going to get caught  
d) No – If I was not going to get caught (meaning you would NEVER use it regardless)  

End of Survey 1

The results of the survey 1 are summarized in table 1 and indicate that students at the Eugene Applebaum College of Pharmacy and Health Sciences indeed have used methylphenidate illegally to aid their concentration while studying.
<table>
<thead>
<tr>
<th></th>
<th>Male</th>
<th>Female</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Total Number Interviewed</strong></td>
<td>12</td>
<td>38</td>
</tr>
<tr>
<td><strong>Age Range</strong></td>
<td>19-32</td>
<td>19-25</td>
</tr>
</tbody>
</table>
| **Aids Used by Survey Participants to Stay Awake While Studying** | Coffee (12)  
Red Bull (6)  
Pop (5)  
Tea (1)  
Coffee Pills (0) | Coffee (36)  
Tea (29)  
Coffee Pills (12)  
Red Bull (9)  
Pop (7) |
| **Number of Survey Participants Who Illegally Use Methylphenidate** | Yes → I have a prescription for it (0)  
No → NEVER (12)  
Yes → I got it from a friend (0) | Yes → I have a prescription for it (0)  
No → NEVER (35)  
Yes → I got it from a friend (3) |
| **Number of Survey Participants Who Believe Methylphenidate Should be Prescribed in Individuals Who Have Not Been Diagnosed With ADHD But Whose Grades and Concentration Would Improve With its Use** | Yes → 4  
No → 8 | Yes → 10  
No → 28 |
| **Individuals That Feel it is Unethical for College Students to be Prescribed Methylphenidate if They Are Less Smart Than the Other Students and Could Use the Extra Help** | Yes → 3  
No → 9 | Yes → 12  
No → 26 |
### Survey Participants who Would Use Methylphenidate Due to its Increase in Concentration in Non-ADHD Individuals

<table>
<thead>
<tr>
<th>Scenario</th>
<th>Response Options</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes → If I was not going to get caught (3)</td>
<td>Yes → If I was not going to get caught (8)</td>
</tr>
<tr>
<td>No → If I was going to get caught (0)</td>
<td>No → If I was going to get caught (6)</td>
</tr>
<tr>
<td>Yes → If I was going to get caught (0)</td>
<td>Yes → If I was going to get caught (0)</td>
</tr>
<tr>
<td>No → If I was not going to get caught (meaning you would NEVER use it regardless) – (9)</td>
<td>No → If I was not going to get caught (meaning you would NEVER use it regardless) – (24)</td>
</tr>
</tbody>
</table>

Reasons why survey participants stated that methylphenidate should not be prescribed in individuals who have not been diagnosed with ADHD but whose grades and concentration would improve with it’s use were:

1. It would be abused and used for other thing besides studying
2. Drugs should only be prescribed to those who have a medical condition that requires it
3. It is not one of the drug’s indications
4. ADHD is over diagnosed
5. Methylphenidate is over-prescribed
6. This is giving students an easy way out and they will become addicted
7. Methylphenidate is a dangerous drug that should be used only in extreme cases of ADHD so that it does not get further abused
8. Do not medicate what hard work can always fix – this is a form of drug abuse
9. People take it because they are lazy
10. Who couldn’t use the help with their grades and concentration? There must be a line!
11. Everyone should see a physician first to be diagnosed as having ADHD
12. Teaches students to take the easy way out as opposed to hard work
13. Students should study harder on their own
14. Students should not rely on drugs to make them smarter
15. If they need it now – they will need if for the rest of their life
16. Students need to seek other ways to improve their academic achievement and not rely on chemicals which are not indicated for them

17. The rich would get the benefit

18. It should only be prescribed IF the patient has ADHD

19. Should NOT rely on drugs for better drags – should depend on what you have learned yourself while in school

20. If a physician prescribes methylphenidate for an off label use

On the other hand, students who felt that methylphenidate should be used to help students improve their grades stated that:

1. If there is a mental health problem that needs to be addressed then a legal medication should be used if it helps

2. If student needs something to help focus, why not use it – do not jeopardize grades

3. The patient may have ADHD, which is an approved indication for methylphenidate

4. If can be very difficult to concentrate in school and that alone could lead to drug abuse

5. If the physician and family think it is necessary/helpful and the benefits outweigh the costs, then yes

6. If they need it and it helps them improve their quality of life, why not?

When survey participants were directly asked if they would ever use methylphenidate due to it’s increase in concentration in non-ADHD individuals, the following comments were listed as no answers. Thus, “No I would not use methylphenidate to help me study if I was not going to get caught because”:

1. A drug is not going to help students get smarter - either you have the brains or you don’t

2. Students should not be in a program they cannot mentally handle

3. Being smart and concentrating are not the same thing

4. This does not make you smarter - the type of advantages it gives you is not ethical

5. Ritalin does NOT make you smarter, it makes you focus so use coffee instead

6. Humans weren’t designed for that much mental exercise/stress. It is reflective of our society’s unrealistic demands of people

7. Students should try to improve study skills

8. Stimulation provided by a controlled substance should not be used simply for this purpose because it is too addictive

When comparing the results obtained from online research and from the survey conducted at the Eugene Applebaum College of Pharmacy and Health Sciences
(EACPHS), it is apparent that the illegal use of methylphenidate is a problem. In fact, according to the studies discussed the average number of students who use methylphenidate illegally as a study aid is 4%.

According to the survey that was conducted at the EACPHS, the percent of students who illegally use methylphenidate as a study aid is 6% (3 out of 50 students). Unfortunately the studies analyzed online did not break down the statistics regarding males and females but at the EACPHS, females were the audacious ones who used it to study.

Furthermore, both the online studies and survey’s conducted highlighted the same concerns students had for using methylphenidate illegally. For example, some students felt that it was unethical for students to use a stimulant to help them study, while some felt that since methylphenidate does not make you smarter, there was no problem in students using it. Regardless of the sources used, all the results were consistent regarding all aspects of illegal methylphenidate use in college students.

It can be noted then that this is actually a growing problem that needs to be addressed at the source of the main problem – over prescribing. In fact, physicians along with the help of pharmacists must balance the risks and benefits of psychostimulant pharmacotherapy carefully when diagnosing, treating, and monitoring their patients. Clinicians should be familiar with NON-psychostimulant alternatives for the treatment of ADHA and other disorders. For example, the FDA recently approved atomoxetine, a nonstimulant nor-epinephrine reuptake inhibitor that has been shown to be safe and effective for the treatment of ADHD in children, adolescents, and adults.

In addition, use of centralized prescription databases, such as the newly introduced Michigan Automated Prescription System, which allows clinicians to access patients’ prescription records, allows for more thorough monitoring and detection of drug-seeking behaviours, such as doctor shopping or the use of multiple pharmacies to obtain controlled substances.

For those doctors who will continue to subscribe methylphenidate, they should have information pamphlets to give to adolescents and adults with ADHD, which should clearly explain the risks of BOTH physical and legal issues of abusing Ritalin.

Overall, since students will always be pressured by the overbearing demands of school, the following are some recommendations for students to ethically enhance their studying habits:

1. Balance is the key - most students are poor time managers and lack the practice in managing their time
2. To avoid all-nighters, students need to spread their work out by having the discipline to work at the same time each evening before going out or taking on leadership responsibilities
3. If a student gets into a routine of working first before playing, he or she will rarely get stressed out because routines and practicing regular study behavioural patterns will ensure success
Furthermore, for individuals who have used methylphenidate illegally in the past can use the following solutions instead although they can be just as dangerous, the legal complications are non-existent. 1-3

1. Strong Coffee: The first resort of generations of bleary-eyed students. An average cup of filter coffee contains 100mg of caffeine. Some research suggests that long-term coffee drinking may increase heart disease, but that it is not linked with the caffeine it contains.

2. Pro-Plus Pills: This is truly instant coffee. Each pill contains 50mg of caffeine. The instructions say take one or two with water, no more than 2 in any hour or 12 tablets in 24 hours but students tend to ignore instructions. Last year, a chemistry undergraduate at Cardiff University consumed 4 cartons of Pro-plus (384 pills) and died.

3. Red Bull: Caffeine laden energy drinks have increasingly substituted for coffee among the young. Red Bull contains 80 mgs of caffeine in an 8 fluid ounce can, compared with 35 mg of caffeine in a standard 12 ounce can of Coke - hence the kick.

Although there are a lot of ethical issues regarding students using various substances to help them concentrate better while studying, illegal methylphenidate use is the most serious crime regardless of the ethical issues brought to light.

References


12. Zernike K. The difference between steroids and Ritalin is…. *NY Times (Print)*. 2005 Mar 20.;WK3.


