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From Prescription to Abuse: Amphetamine Use Among the American Youth

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Abstract

Amphetamines pose a significant problem for American youth. Other drugs that are abused, like opiods, cannabis, nicotine, and alcohol are in the news, such that amphetamines are not often discussed. However, students seeking an edge in academic performance continue to abuse both legal and illicit amphetamines to the extent that its use and abuse is a public health emergency. This paper will trace how amphetamines entered common usage, the dangers of its use, and will propose ways to address this problem.

Keywords: *Amphetamines, American youth*

1. Introduction

How amphetamines entered American culture is one of the topics thoroughly explored in the book by Marisa A. Miller, *Amphetamine Misuse: International Perspectives on Current Trends* (Klee, 1997). In chapter six, "History and Epidemiology of Amphetamine Use in the United States," Dr. Miller begins by describing the pharmacological components of the family of drugs that today we commonly lump together, and then details how the drugs invaded the mainstream of the American medical armamentarium, to the point where they are presently both medically useful and widely abused. The information provided by Dr. Miller helps us understand the problem use of amphetamines poses to students.

Amphetamines and methamphetamines, relating closely in chemical structure and physiological effects, were first synthesized in the 1880s. The properties of the drugs allowed it to act as a bronchodilator (widening of the bronchi in the lungs, thus facilitating breathing) and hypertensive agent (increasing blood pressure). Its early medical applications were to reverse barbiturate anesthesia and to treat lung congestion. Throughout the following decades,

amphetamines were also applied to treat various additional ailments, including schizophrenia, low blood pressure, head injuries, and radiation sickness.

Dr. Miller points out that, since the early 1930s, amphetamines have been used in the United States. Its use was prevalent in the military during World War II, during which an estimated 200 million tablets were supplied to US troops, for the obvious reason of keeping soldiers alert during periods of great stress without adequate rest. This circumstance contributed to its notoriety as a psychological stimulant.

Sold as a non-prescription drug until 1951, and marketed as a safe and risk-free product, amphetamines quickly gained popularity among the general population for uses that were not prescribed by physicians. Thus, the drugs were used not only legitimately for medical purposes but also illicitly. Throughout the 1950s and 1960s, amphetamines were widely used as an antidote for fatigue, primarily by populations experiencing high stress and intensity levels, and the need to stay awake when tired. These groups included businessmen, truck drivers, and students.

The ability of amphetamines to prevent fatigue was not the only reason for its use to spread. The popularity of illicit use of amphetamines was also sparked in the late 1950s by its being prescribed as a treatment for heroin addiction. New convenient forms of administration--its availability in liquid form and through an inhaler--also facilitated its use. During the countercultural revolution of the 1960s, it was marketed under names such as 'meth', 'speed', and 'ecstasy', and quickly surpassed other drugs (such as LSD) in popularity and use. These underground markets were fueled by the pharmaceutical industry, until 1971, when the United States Department of Justice focused on the problem, and began to block the diversion of legal drugs to illicit "street" distribution. Measures that the DOJ used included establishing strict production quotas and monitoring legal distribution.

However, the efforts of the government to control the flow of amphetamines to the public were not completely effective. Unlike other commonly abused drugs such as marijiana and cocaine, the problem with amphetamines is that this class of drugs is easily manufactured from readily available components found in products that do not require a prescription. The advent of mass produced pharmaceuticals (such as pseudoephedrine--a common non-prescription cold and allergy remedy present in some over-the-counter medications) have allowed for greater illicit production, including among college-student populations, who were eager to obtain the substance because of its performance-enhancing properties. Additionally, the growth of pharmaceutical amphetamines, including Ritalin, Adderall, Vyvanse, and methylphenidate, and the number of legal prescriptions for these medications, made them readily available. Students without prescriptions could obtain the drugs from an acquaintance who had a valid prescription. With the advent of the Internet, online resources also contributed to its availability.[1]

2. Discussion

[1] Rachel Gonzales, Larissa Mooney, and Richard Rawson, "The Methamphetamine Problem in the United States," Annu Rev Public Health, no. 31 (2010), US National Library of Medicine.

Federal response to misuse of all drugs dates back to the late 1960s, culminating in the enactment of The Comprehensive Drug Abuse Prevention and Control Act of 1970 (CDAPCA), which permitted interdiction by law enforcement, and limited legitimate prescribed uses for amphetamines. Additionally, the Act enhanced the punishment for offenders who manufactured or distributed the drugs in the presence of anyone under the age of 18–a provision designed to protect adolescents:

> Whoever violates section 401(a)(1) by manufacturing or distributing, or possessing with intent to manufacture or distribute, methamphetamine or its salts, isomers or salts of isomers on premises in which an individual who is under the age of 18 years is present or resides, shall, in addition to any other sentence imposed, be imprisoned for a period of any term of years but not more than 20 years, subject to a fine, or both.[2]

The focus on children coincided with an increase in prescriptions for elementary school-age students who were diagnosed with Attention-Deficit Hyperactivity Disorder, discussed below.

The CDAPCA highlighted the consequential effects of amphetamine use on adolescent health, attempting to mitigate its use among students in an era of widespread drug abuse. However, the Act did not protect adolescents who were receiving amphetamines as prescription medications.

The widespread use of amphetamines in the United States surfaced once again in the 1980s with its use as a treatment for Attention-Deficit Hyperactivity Disorder (ADHD). The stimulant's properties allowed for children and adults alike to reduce acute hyperactive symptoms, such as fidgeting and interrupted attention span, by 70-80%.[3] However, its many side effects, including irritability and depression, led most prescribed users to end long-term treatment.

Despite patients terminating prescribed treatment, the prevalence of the ADHD diagnosis led to an increase in the manufacture of prescription-grade amphetamines making them readily available, especially to younger demographics. Between 2007 and 2011, prescriptions for ADHD medication in patients aged 20-39 increased by a factor of two and a half, with a total of 14 million prescriptions written in 2011 alone.[4] This increase in the use of amphetamines is seen in both individuals under professional care and those using the drugs without medical supervision.

[2] Comprehensive Drug Abuse Prevention and Control Act (1970), Pub. L. No. 91-513, 84 Stat. (Oct. 27, 1970).

[3] Claire Advokat and Mindy Scheithauer, "Attention-deficit Hyperactivity Disorder (ADHD) Stimulant Medications as Cognitive Enhancers," Front Neurosci 7, no. 82 (2013), US National Library of Medicine.

[4] Alan Schwarz, "Drowned in a Stream of Prescriptions," The New York Times, February 2, 2013, accessed July 22, 2019.

Dr. Claire Advokat, the authority cited in footnote 2 above, about the increase in amphetamine prescriptions for elementary school children, noted in one of her earlier studies, that college-age populations also saw an increase in the use of prescribed stimulants, which corresponded with a growth in its illicit use. In analyzing student misuse, Dr. Advokat observed that amphetamines were generally used by older students to increase concentration, organization, and alertness for long periods of time.[5]

Although the use of amphetamine stimulant medications for increased academic performance is widespread across the United States, survey-based studies document a vast disparity in academic performance between ADHD-positive groups and controls, with the former earning an average Grade Point Average (GPA) of 3.05[6]– 0.14 points lower than the control group who did not take the drugs. Moreover, among the ADHD group, students who took stimulant medications presented minimal academic benefits compared to the control group; those who took medication averaged a 2.95, while the control was at a 2.89.[7]

A further analysis of the data showed a greater increase in average GPA with the implementation of healthy study habits, including prior preparation–while the non-stimulant group had a noticeably smaller population of students who established these habits (3 as compared to the 19 students in the stimulant-using group). This means that students with good study habits, whether using drugs or not, achieved similar GPA scores. These differences in academic performance indicate that increased performance is associated with better work habits rather than drug use.

The suggestion that better study habits rather than increased use of amphetamines is responsible for improved grade scores is borne out by data from the aforementioned study,[8] which relied upon self-report survey responses of ADHD-diagnosed undergraduates. Over 90% of students agreed that stimulant medication aided in improving concentration, alertness, and organization.[9] Both ADHD-positive and control groups stated that they shared similar study habits to their peers, both in classroom work and work on their own. However, while the control group experienced little harm in their GPA from not studying prior to major assessments, students diagnosed with ADHD had significantly lower scores. Advokat's analysis suggests that, although stimulant medications may aid in mitigating symptoms of ADHD, the drugs alone did little to improve academic performance without a concomitant improvement in study habits.

[5] C. D. Advokat, D. Guidry, and L. Marino, "Licit and Illicit Use of Medications for Attention-Deficit Hyperactivity Disorder in Undergraduate College Students," J Am Coll Health, May/June 2008

[6] The Grade Point Average (GPA) system is ranked out of a maximum possible score of 4.0.

[7] Advokat and Scheithauer, "Attention-deficit Hyperactivity".

[8] Ibid

[9] Ibid.

The minimal effect of stimulants alone on academic performance may be attributed to its several negative cognitive side effects. Amphetamine and methylphenidate-based medications Methylenedioxymethamphetamine, abbreviated with the acronym "MDMA") may mitigate "emotional dysregulation"[10] and increase self-awareness and cognitive stamina, which can lead to improved ability to study on one's own, and thus greater academic growth. However, stimulant use was also attributed to an increase in risky behavior, potentially detrimental to a student's ability to focus due to increased environmental distractions.

Thus, one take-away from our paper is that amphetamines used by students to improve study habits and better focus on process-oriented behavior, may be a good thing. Using amphetamines to cram for an exam the night before is not.

To many, the physiological and psychological side effects of amphetamines and other stimulants have deterred long-term use. Continuation of use of ADHD medications among elementary-aged students is estimated to be between the range of 36-84.8%--a wide range. The reason students discontinue taking the medication is primarily attributed to side effects such as mood changes, irritability, and depression.[11]

Longitudinal studies conducted in secondary schools in Quebec, Canada provide similar results, with approximately 15.1 percent of the 3,880 students surveyed reporting an elevation of depressive symptoms as they entered the 11th grade. Students who used recreational MDMA and amphetamines were 1.7 and 1.6 times more likely to present these symptoms, respectively, with individuals who concurrently used both products being 1.9 times more likely to be depressed than control populations.[12] The results appeared to be consistent through different demographics, and across gender lines.[13]

Advokat and Brière's research highlights the emotional and psychological detriment from student amphetamine use, in both prescribed and recreational scenarios. Brière suggests that, due to the influence of depressive symptoms in social development and drug-induced neurotoxicity, adolescent amphetamine use could result in long-term detriment to mental health.[14]

Beyond potential psychological detriment, the use of amphetamine and methamphetamine-based narcotics has been linked to numerous negative social correlates. A

[10] Ibid.

[11] Sara L. Toomey et al., "Why Do Children With ADHD Discontinue Their Medication?," Clinical Pediatrics 51, no. 8 (2012), accessed August 19, 2019.

[12] Frédéric N. Brière et al., "Prospective Associations between Meth/Amphetamine (Speed) and MDMA (Ecstasy) Use and Depressive Symptoms in Secondary School Students," Journal of Epidemiology and Community Health 66, no. 11 (November 2012): 992, JSTOR.

[13] Out of the total n=3880 surveyed, n=2210 were female and n=1770 were male.

[14] Brière et al., "Prospective Associations," 993.

study based on secondary-school students in Oregon (conducted by Dennis Embry) found several behavioral issues consistently linked with methamphetamine use, including antisocial behavior, substance abuse, and risky sexual interactions. Among female students, methamphetamine abuse was significantly higher in those who engage in antisocial activities and the use of other illicit drugs, such as marijuana—throughout the 11th grade female population. The odds ratio of antisocial behavior to methamphetamine use was calculated to be 5.70, and that of marijuana use in the 8th grade population was determined to be 3.39.[15] For male populations, substance abuse of the individual and his peers was the most common variable, with marijuana being the most prevalent in the 11th grade (with an odds ratio of 4.86) and alcohol most prevalent in the 8th grade (with an odds ratio of 7.92).[16] Additionally, risky sexual behavior was shown to correlate to methamphetamine abuse, primarily in both 11th grade male and female populations (odd ratio values of 2.32 and 3.43, respectively).[17] Embry's analysis suggests correlations between methamphetamine use and other illicit behaviors, citing that deterrence efforts to these related activities may prevent further substance abuse.

The linking of amphetamines with the enhancement of neurological performance has been ingrained in the American psyche, dating back to its initial synthesis and use in the early 20th century. One of the primary factors in why amphetamines are not viewed as dangerous, and why the public does not demand action, is that the media, from mainstream outlets to professional bioethical and public health publications, present positive stories about the benefits of the use of amphetamines. Some studies describe the use of methylphenidate (the active ingredient in Ritalin) to be primarily a "lifestyle choice,"[18] with benefits including heightened concentration and focus.

The connotations of amphetamines as cognitive enhancers is further implied by reference to them as "study aids," "brain steroids," and "smart drugs."[19] Terms such as "cognitive enhancement" and "neuroenhancement" were originally only used by bioethics publications; terms like "abuse" and "misuse" were the common way amphetamines were referred to in public health literature.[20] The divide between how mainstream journalists and professionals in the field characterized the drugs contributed to discrepancies between conventional and professional

[15] Dennis Embry et al., *Behavioral and Social Correlates of Methamphetamine Use in a Population-based Sample of Early and Later Adolescents* (n.p., 2008), US National Library of Medicine.

[16] Ibid.

[17] Ibid.

[18] The samples were sourced from databases including *Factiva* and *LexisNexis Academic*, including news, business, and law articles. Bioethics and public health resources were sourced from standard databases.

[19] Cynthia Forlini and Eric Racine, *Disagreements with Implications: Diverging Discourses on the Ethics of Non-Medical Use of Methylphenidate for Performance Enhancement* (n.p.: BMC Medical Ethics, 2009).

[20] Ibid.

perspectives; the media chose not to focus on the damaging psychological and physiological effects, so the public at large was not alarmed.[21]

Across the three platforms--mainstream media, bioethical, and public health publications--all agree that the primary issue regarding amphetamine abuse is that the drug is socially acceptable because insurance companies pay for it, and even black market amphetamines originally enter the system by having been legally prescribed. In the minds of the layperson, a *prescription medication* is different from a *street drug.*[22]

Another reason that amphetamines are socially acceptable, according to the article by Forlini and Racine, is that amphetamines suit the attitudes of the current culture.

> "Ritalin makes repetitive, boring tasks like cleaning your room seem fun," (...) "I equate it in my mind with a really strong cup of coffee" [46]), social meaning (e.g., "Ritalin acts as a quick fix for problems that are the product of the rapid-fire culture and the hurried society in which we live" [23]

A drug, prescribed by licensed medical practitioners, covered by insurance, having similar cognitive benefits to products containing caffeine, is simply not viewed as *dangerous*.[24]

Samples of bioethics publications present the greatest diversity of discussion, both in coverage of ethical, social, and legal bases and representation of affirmative and opposing arguments. Public health and mainstream outlets do not discuss all of the negative issues, including the unfair advantage the wealthy have in obtaining the drugs.[25] Overwhelmingly, all three platforms cited overprescription as a key issue regarding Ritalin abuse.[26]

Analysis of the media's coverage of the amphetamine crisis reflects the survey and historical data, providing substantial evidence of its multifaceted issues, which were associated with ambivalence toward this class of drugs since their original introduction more than 100 years ago.

3. Conclusion

The gist of the studies cited in the first part of this paper is that amphetamine use is highly correlated with antisocial behavior among adolescents as early as the eighth grade, continuing

[21] Ibid.

[22] Ibid.

[23] Ibid.

[24] Ibid.

[25] Ibid.

[26] Ibid.

through their undergraduate collegiate years. The many facets of the amphetamine crisis in the United States, from its origins as a widespread pharmaceutical to its resurgence with a rise of accessible resources for its synthesis, further complicate matters. Additionally, the lack of substantial research behind amphetamines as a stimulant, especially in younger demographics, leaves little guidance for the formulation of possible courses of action. The issues of adolescent amphetamine abuse are ones that cannot be solved in the same manner as other recreational drug epidemics, contrary to its portrayal in societal outlets and media.

Due to the extensive history of amphetamines in the United States, it is unlikely that issues regarding the misuse of prescription drugs will be completely solved on a legislative basis. Rachel Gonzales, an expert in public health policy, addressing the continued prevalence of amphetamines in the "landscape of drug abuse problems" for the foreseeable future, suggests a strategic approach to research, prevention, and treatment.[27] Possible areas of implementation include improvements in epidemiological assessment, increased monitoring to identify affected groups, federal prevention programs, and a health-focused approach to illicit use of narcotics. In establishing these institutions on a national level, Gonzales aims to further develop preliminary action that has taken place in states such as Montana, Kansas, and California.[28]

Numerous paths of deterrence, through legislation and education, have been proposed to address the current amphetamine crisis. The most common recommendation is to conduct further research, specifically on drug abuse among younger demographics. In both their use as a treatment for ADHD and as a cognitive enhancer, amphetamines have been heavily underrepresented in study and analysis, giving way for societal biases instead of a foundation of empirical evidence to back federal action. Although research in amphetamine's efficacy on individuals diagnosed with ADHD has been published in public health and bioethics circles, further work to replicate data must be conducted to establish its effects on broader populations.[29] Furthermore, longitudinal data research must be conducted to establish associations between adolescent and adult stimulant use.

Despite the lack of long-term data on the effects of amphetamines on student populations, several steps have been proposed. Analysis of undergraduates diagnosed with ADHD have found that a healthy and consistent schedule, in concurrence with prescribed medications, can aid in increased concentration and overall academic performance.[30] In terms of illicit use, the prevention and treatment of related behaviors, such as depression and antisocial habits, may aid in deterring amphetamine misuse.[31] In addition, addressing the misrepresentation of

[27] Gonzales, Mooney, and Rawson, "The Methamphetamine."

[28] Ibid.

[29] Toomey et al., "Why Do Children."

[30] Advokat and Scheithauer, "Attention-deficit Hyperactivity."

[31] Embry et al., *Behavioral and Social*.

amphetamines in mainstream outlets, along with public action towards presenting scientific evidence, can help engage a greater population in discussions about the use of stimulants.[32]

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