Substance Use Among Physicians and Medical Students

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Background: *Physicians and medical students whose substance use causes impairment pose a risk to both themselves and their patients. Drug abuse is a documented problem in physicians; however, few studies have investigated the rates of drug abuse in medical students. While treatment plans may be tailored for both students and attending physicians, there is often a reluctance to refer one's self or a colleague due to a variety of reasons related to fear of repercussions, belief the problem has already been addressed, failure to recognize, or ignorance. This review provides a brief background on common signs and symptoms of potential abuse and resources available to doctors in training at various stages of their career, along with providing a clear picture of the literature as it pertains to physician and medical student substance abuse.*

Methods: *Extensive search of the literature utilized physical and electronic resources available at the National Institutes of Health Library and the National Library of Medicine with search results limited to the topics of physician or medical student substance use, substance abuse, impairment, and treatment.*

Results: *Sparse recent data regarding physician and medical student substance abuse are available. Studies completed two decades ago demonstrate that drug abuse was a significant problem for doctors and medical students at that time.*

Conclusion: *Due to outdated, and/or incomplete data on substance abuse in physicians and especially medical students, it is difficult to report the current extent of substance abuse in these groups. Nonetheless, it is important to recognize substance abuse in these populations and promote referral to substance abuse programs. Early rehabilitation and treatment improves both career and patient outcomes. This study highly suggests the need for up-to-date information regarding substance abuse in the medical community so that appropriate resources can be developed and effectively utilized.*

Keywords: *substance-related disorders; alcohol abuse; physician health programs; drug use; drug abuse.*

INTRODUCTION

Substance abuse[†] is an ongoing public health concern. Worldwide, an estimated 167–315 million people between the ages of 15–64 use illicit substances.[3] Although the prevalence of some drug use has been largely decreasing over the past decade, the overall use of illicit substances in the United States has been slightly increasing.[4] For instance, in the past decade prescription opioid abuse has reached epidemic proportions.[5] Use of illicit and controlled substances, in addition to excessive use of alcohol, is strongly influenced by many factors, including: age, gender, family history, and the presence of co-occurring psychiatric disorders. While drugs are abused by persons of all ages, young persons aged 16–35 use the largest proportion of drugs of any age group.[4] Many additional factors, including: race, geographic location, arrest history, and age at first use of drugs predispose individuals to drug abuse.[4]

[†]Several terms for the purpose of this review: 'Drugs' includes prescription pharmaceuticals, non-prescription pharmaceuticals, alcohol, and other substances of abuse. The term 'drug abuse' is defined as a pattern of drug use that causes recurrent problems for the individual. 'Drug dependence' and 'drug addiction' are used synonymously to mean the use of drugs such that it not only causes problems, but also renders the user unable to control his use. Although the diagnostic and statistical manual 5 (DSM-5) finds insufficient validity to support drug abuse or drug dependence as diagnostic entities and combines them into a single 'substance use disorder' diagnosis, the studies cited in this review occurred prior to DSM-5.[1] Therefore, use of the terms 'abuse' and 'dependence' or 'addiction', with knowledge that nosology in this area is evolving, is preserved. 'Impairment', as recommended by the Federation of State Medical Boards, is defined as substance use that causes the inability to practice medicine with usual skill and safety.[2]

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While certain risk factors for clinicians and medical students are similar to that of the general population, clinicians and medical students each have distinct stressors and predispositions for drug abuse. The data on drug use in these populations pale in comparison to the vast data collected on the general population. One of the first major publications reporting on physician drug use and resultant impairment was 'The Sick Physician' published in 1973.[6] This seminal paper called for the need to treat impaired physicians and led to the development of physician health programs (PHPs). These state programs were put in place in order to treat and rehabilitate impaired physicians. While studies regarding physician substance use followed this initial paper, several of the commonly cited comprehensive articles used to draw conclusions regarding the prevalence of substance use among physicians are more than two decades old. Moreover, data regarding the prevalence of medical student substance abuse are even more sparse. The original purpose of this article was to examine and report on the current prevalence of physician and medical student substance abuse. However, available data are outdated and often incomplete. Therefore, the goal of this article was modified to instead offer a thorough review of the currently available literature reporting on substance abuse in physicians and medical students, available treatment of substance abuse for both groups, and means to recognize an impaired colleague.

METHODS

Literature review

Research related to substance use among physicians and medical students was searched using resources available at the National Institutes of Health, including the National Institutes of Health Library and the National Library of Medicine. We used a three step screening process to retrieve relevant papers. (1) Using PubMed as the primary search engine, key words entered included combinations of the terms: 'physician', 'medical student', 'abuse', 'drugs', 'drug use', 'impairment', 'treatment', and 'PHPs'. (2) The abstracts of all retrieved studies were reviewed to determine relevance to our paper. Relevance was determined by the presence of primary data collected from physicians and/or medical students or references to primary data. (3) All studies deemed relevant were fully reviewed. Further, the references cited in the selected publications were subsequently reviewed for additional relevant articles that were absent from the PubMed search. These papers were retrieved, if possible, and subjected to steps 2 and 3 of the same 3-step screening process as those papers initially retrieved from PubMed.

PHP information

Information regarding individual PHPs was retrieved through one of two methods. First, some articles retrieved in the literature review contained information pertaining to PHPs, including PHP practices, success rates, and programs. Second, information on PHPs was retrieved from the Federation of State Physician Health Programs website (FSPHP) or directly from the individual state PHP website. The FSPHP website had information about PHPs in general without focusing on any single state's PHP practices. The individual state PHP websites contained information and practices particular to its PHP. This review focuses upon the general practices of PHP, and not directly on any specific state's practices.

Medical school handbook retrieval

Thirty medical schools were selected randomly from a list of all current medical schools in the United States. Handbooks for these medical schools were retrieved from publicly accessible material posted on medical school websites using the Google search engine. Search terms used to retrieve handbooks included 'medical school handbook', 'substance abuse policy in medical school', or 'medical student impairment'. The results were limited to schools whose handbooks were available online and were therefore not completely random. Handbooks were found by this retrieval method for 21 of 30 medical schools searched. The most recent edition of each medical school handbook was searched for an individual medical school's substance abuse policy. When possible, older editions of the medical school handbooks were compared to newer editions of the handbooks to track changes over time of medical student substance abuse policies.

RESULTS

Literature on drug abuse by physicians

Physicians and medical students are by no means exempt from illicit and inappropriate drug use or abuse. Physicians abuse drugs, both controlled substances and illicit drugs, at similar rates to the general population. However, physicians abuse prescription drugs at higher rates.[7] A more recent study showed relatively high rates of alcohol abuse and dependence in a sample of surgeons, with the highest rates in women.[8] The stress involved in medical training and providing medical care to patients results in extreme educational and professional demands – two major

factors that students and doctors, respectively, must manage on a daily basis. Relatively high rates of burnout in medical students and physicians may reflect the impact of these stressors.[9,10] Medicine presents a unique situation in that personnel are placed within easy access of substances with addictive potential, though newer techniques of tracking the use of potentially addictive substances in medical settings has improved.[11] Medical education should address the issue of how drug abuse impacts physician health and how to help oneself and colleagues. Reluctance to report an impaired colleague tends to delay treatment and may endanger patients, presenting a potentially serious problem.[12]

Misuse of medications may begin as self-treatment with prescription drugs. Drug use may also involve diversion of controlled medications from patients or use of illicit drugs and alcohol.[13] Within practicing physicians, select specialties have significantly higher rates of abuse than others.[14] For example, anesthesiologists most commonly abuse opioids due to their relative ease of access in the operating room, whereas most other physicians abuse substances that they may find easier to obtain.[15,16] Other examples of cited abuse patterns in physicians include psychiatrists and emergency physicians abusing benzodiazepines and marijuana, respectively.[17]

Treatment of impairment due to drug abuse beyond medical school

Most states have an established program, PHP, managed by the state to treat impaired physicians and other medical personnel.[18] State PHPs were designed to provide confidential support to the impaired physician in addition to protecting the public. These programs provide case management for physicians struggling with substance use disorders. Compared to alternative treatment options for substance use disorders with less intensive treatment and less rigorous monitoring of participants, PHPs have shown significantly higher success rates.[19]

In order to encourage early stage treatment, state laws may allow the identity of physicians who report themselves to remain confidential without necessarily disclosing his/her identity to the National Practitioner Data Bank or even to the state medical board.[20] The success rate of PHPs is in part due to the complete care and oversight that is provided as well as a customized treatment plan.[19] The contract that a physician makes with a PHP upon entering includes intense treatment from a choice of providers in addition to mutual help groups such as alcoholics or narcotics anonymous. In general, they must also submit to workplace visits and random drug testing for a period of time during and after treatment. In many cases, participation in a PHP can last up to 5 years.[19,20] Due to their successful outcomes, some PHPs have expanded their programs to include residents, nurses, physician assistants, dentists, pharmacists, and veterinarians.[21–23]

Literature on drug abuse by medical students

While physician data are more readily available, there have been few publications reporting on the prevalence of drug abuse and impairment of medical school students.[24–34] The study that offers the strongest possibility of drawing conclusions regarding prevalence of drug abuse among medical students in the US was completed in 1991 and surveyed $\sim$2000 students at 23 medical schools representing $\sim$20% of US medical schools. Of the remaining studies, two represent between 10% and 20%, and the rest $<$5% of US medical schools. Examining these data accurately can be challenging due in part to differences in data collection methodology, substances studied, changes in cultural attitudes during the duration of the study, and traditionally small samples of medical students or medical schools. Even with these differences, some observations may be made from the available literature regarding medical student drug abuse.

Available research indicates that, traditionally, the actual rate of drug use in medical school has been similar, if not lower, than that of an equivalent non-medical school population for many drugs.[24] However, medical students have still been reported to use alcohol, marijuana, psychedelics, tranquilizers, and opioids. A recent survey at one medical school showed that 10% of medical students had a history of unprescribed use of prescription stimulants.[35] A medical student's drug use behavior typically begins prior to initiating their medical education during high school and college.[24] Abuse of tranquilizers (e.g., benzodiazepines) is an exception in that its use more frequently begins during medical school.[24,31] The rate of drug abuse seen in medical school may involve the stress of medical school, family history, and emotional distress.[31,36] A substance use disorder most likely originates from a combination of these factors.[37] One of the best available studies finds that binge drinking episodes are correlated with experiences of belittlement and harassment in school.[34] Medical student drug abuse data, while reflecting general trends, may be inaccurate due to the bias of

self-reporting – a problem seen with data collected in other fields.

The most comprehensive studies regarding drug use typically cited for medical students are predominantly from the 1980s and 1990s (Table 1). While the data in Table 1 have been offered as a representation of the available data on substance use by medical students, the use of each substance reported on may or may not reflect the current use of these substances by medical students. This unfortunately limits the conclusions that may be drawn from these studies. Therefore, without more recent data on medical student drug use, and with changing drug use trends seen in the general population, newer studies are needed to better characterize the behavior of this population. Furthermore, comparison of the data in the cited studies is less meaningful because of inconsistency in methods used to collect data from dissimilar populations.

Treatment of impairment due to drug abuse during medical school

The problem of medical student drug use and abuse has been reported for years and only more recently have medical schools formally started addressing the issue with the inclusion of policies and procedures in student handbooks that may not have existed as little as 10 years ago.[45,46] While there is no standard policy for treating impaired medical students across institutions, there are certain similarities in processing of cases. Many schools publish their student handbooks containing impairment policies online, some of which are discussed in the current review.[46–65]

Sixteen of the 21 medical school policies researched, which we use as a sample of current medical school practices, required direct referrals of suspected impairment due to substance abuse to Student Health Services (or an equivalent service), an associate Dean, or a student-faculty committee.[46–48,51–55,57–60,62,64] To encourage students to seek early intervention, nearly one-third of medical schools in our cohort listed in their handbooks that they will forego disciplinary action of impaired students who self-refer for treatment.[47,50,56,57,59,60,62,64] This one-third of medical schools listed the following common ideas regarding treatment and reintegration of the impaired medical student following identification: (1) Evaluation – The impaired individuals would receive an evaluation to determine the extent of the problem. (2) Treatment – The medical student must undergo a recommended course of treatment if indicated. The treatment would be tailored to the individual medical student by an addiction specialist. (3) Confidentiality – In order to offer the greatest degree of confidentiality to the student, treatment professionals should use discretion in what information is provided to the medical school and to whom in the medical school it is provided. Appropriate treatment should provide the impaired student with the best chance of reintegration into their educational and clinical duties. Many medical schools show flexibility in accommodating the recommended treatment plan into the course of a student's studies. Due to the sensitive nature of the subject, medical schools treat cases of impairment with confidentiality, as legally permitted, to reduce the stigma associated with impairment and encourage individuals to receive help.[46–65]

Recognizing addictive behavior

Recognizing a peer who may be impaired due to drug abuse is the first step toward trying to provide an individual with treatment. Interestingly, a change in work performance is often not obvious until late in the timeline of drug abuse. Many physicians struggle with drug abuse or addiction for years before it is evident at work due to impairment.[37,66] Since many physicians and students struggling with chemical dependence are still able to function at a reasonably high level, along with the fear of repercussions resulting from seeking treatment, many believe they can manage their own recovery.[11]

Although impaired physicians and medical students have the capability to mask their abuse of drugs, the effect that it has on their ability to perform professionally may be manifested in a variety of ways (Table 2). Physical, social, and emotional changes in the individual may be noted. Some of the more common signs of drug addiction include changes in diet or appearance, anxiety, defensiveness or otherwise disruptive behavior, unusual drug orders, domestic distress, and depression.[37,67] One key change in behavior includes inaccessibility and withdrawal from social settings with colleagues or 'preferred solitude'.[11,66,67] It is not to say that everyone who has any change in personality or behavior is abusing drugs, rather that noticeable long term changes that appear to be interfering with everyday life and duties should be noted and examined more carefully.

The problem of recognition lies not only with the impaired physician, but also with his or her peers. The failure of a colleague to report the impaired physician can be a result of several factors. Commonly, colleagues of impaired physicians believe that the problem has

Table 1. Results of substance use and abuse among US medical students reported from 1973 to 2013

		Number of medical schools	Number of medical students	Alcohol usage	Tobacco usage	Stimulant/ amphetamine usage	Cocaine usage (%)	Marijuana usage
Lipp et al., 1971		4	1,063					47% lifetime
								28% current
								10.7% > 100 times
Solursh et al., 1971		1	85	2% never	39% never			27% never
				60% weekly	11% weekly			17% weekly
				11% daily	11% daily			1% daily
Mechanick et al., 1973	1970	1	463					54% lifetime
								21% > 50 times
	1972		449					70% lifetime
								30% > 50 times
Rochford et al., 1977		Not reported	144					26% never
								46.5% < 50 times
								27% > 50 times
Maddux et al., 1986	Ever used	Not reported	133	96%	44%	22%	20%	57%
	Last 30 days			82%	12%	3%	3%	13%
McAuliffe et al., 1986	Ever used	Multiple	504				39%	72%
	Regular use						4%	12%
Conard et al., 1988	Ever used	13	604	97.3%		27%	36.2%	73.7%
	Regular use			87.8%	9%	1.2%	5.6%	17.3%
Baldwin et al., 1991	Ever used	23	2,046	98.1%	55.3%	22.8%	32.5%	66.4%
	Regular use			87.5%	10%	0.3%	2.8%	10%

Table 1 (*Continued*)

		Number of medical schools	Number of medical students	Alcohol usage	Tobacco usage	Stimulant/ amphetamine usage	Cocaine usage (%)	Marijuana usage
Frank et al., 2008		16	1,428	21% not in past 30 days				
				37% excessive* in past 30 days				
Horowitz et al., 2008		1	340				5.9%	4.1%
Choi et al., 2013		1	319	84% in past 30 days		5%		1%
				31% excessively*				
Webb et al., 2013		Not reported	144			20% at least once		
						15% during medical school		
Lipp et al., 1971		4	1,063					47% lifetime use
								28% current use
								10.7% > 100 times
Solursh et al., 1971		1	85	2% never used	39% never used			27% never used
				60% weekly use	11% weekly use			17% weekly use
				11% daily use	11% daily use			1% daily use
Mechanick et al., 1973	1970	1	463					54% lifetime use
								21% > 50 times used
	1972		449					70% lifetime use
								30% > 50 times used
Rochford et al., 1977		Not reported	144					26% never used
								46.5% < 50 times used
								27% > 50 times used
Maddux et al., 1986	Ever used	Not reported	133	96%	44%	22%	20%	57%
	Last 30 days			82%	12%	3%	3%	13%
McAuliffe et al., 1986	Ever used	Multiple	504				39%	72%
	Regular use						4%	12%

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	Regular use			87.8%	9%	1.2%	5.6%	17.3%
Baldwin et al., 1991	Ever used	23	2,046	98.1%	55.3%	22.8%	32.5%	66.4%
	Regular use			87.5%	10%	0.3%	2.8%	10%
Frank et al., 2008		16	1,428	21% not in past 30 days				
				37% excessive* in past 30 days				
Horowitz et al., 2008		1	340				5.9%	4.1%
Choi et al., 2013		1	319	84% in past 30 days		5%		1%
				31% excessively*				
Webb et al., 2013		Not reported	144			20% at least once		
						15% during medical school		

Blank sections correspond to substances that were not addressed by the listed paper.[24,26,31,32,34,38–44]

*Excessive defined as meeting at least one of the following: $\geq$5 drinks on one occasion (binge drinking), men averaging $\geq$2 drinks/day or women averaging $\geq$1 drinks/day.[34,43]

Table 2. Common symptoms of a physician with substance abuse problems

Socially removed	Sexual promiscuity
Decreased performance	Smell of alcohol
Spending more time at work	Heavy drinking at events
Change in diet/appearance	Problems with law enforcement
Inaccessibility/frequent absences	Excessive sweating
Defensiveness/irritability/conflicts with co-workers	Patient complaints
Unusual drug orders	Frequent illness/injury
Domestic distress	Isolates themselves in office
Mood swings (euphoria/depression/anxiety)	Ataxic gait/slurred speech/tremors

The actual symptoms associated with substance abuse are highly variable. The list of substance abuse symptoms is a non-exhaustive list intended only to describe common presentations of substance abuse in medical students/physicians.[11,15,37,66–69]

already been addressed.[12] Other factors include the belief that reporting might not lead to action and the fear that reporting will affect their own career.[12] Medical students, in particular, overwhelmingly fail to report peers with symptoms characteristic of addictive behaviors possibly due to downplaying of the scenario or a failure to recognize its serious nature.[33] The medical profession as a whole often employs the 'conspiracy of silence' in an attempt to preserve the image of the physician.[37,66] It is the responsibility of colleagues and peers to refer a possibly impaired individual to the appropriate professionals as the impaired physician or student is less likely to seek treatment on his or her own. Medical training should include discussion of this responsibility and health care organizations should provide consultation and support for physicians and students who come forward with concerns about the health of peers.

CONCLUSIONS

Drug abuse by physicians and medical students was determined to be a significant problem in studies completed 20 or more years ago. Unfortunately, these studies have not been repeated in large numbers. The the current extent of physician and medical student drug abuse and related impairment issues are not well known. Complicating the issue is the challenge of diagnosing and referring colleagues in a system where self-preservation is seen as key to a physician's success. An awareness of symptoms and a willingness to refer a fellow student could lead to earlier recognition of the impairment, significantly impacting and potentially improving the career path of the medical student and future colleague.

Substance use disorders are as treatable as other illnesses that require behavioral changes, especially with early intervention.[70,71] Seeking professional help for one's self or a colleague significantly improves outcomes and help is available through many avenues including medical schools and PHPs. Attempts to self-treat or manage the care of a colleague informally may be misguided and are ill-advised, particularly given the success of structured rehabilitation programs. Of note, fear of possibly destroying one's career is also a concern of medical students and physicians. In an attempt to remove this barrier to seeking help, many interventions focus on successfully rehabilitating medical students and physicians while preserving their ability to continue to practice medicine.

Finally, the magnitude of drug abuse in medical students has not been recently assessed and may be different from historical data due to changing drug habits and cultural shifts as paralleled in the general population. Furthermore, the environments in medical schools and hospitals have also changed, which could also impact drug use. An updated, comprehensive study of medical student drug abuse is needed to provide a better scope of trends in drug abuse among medical students and perhaps lead to improved education, awareness, prevention, and treatment.

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