


The use of drugs and medical students: a literature review

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SUMMARY

INTRODUCTION: *The consumption and abuse of alcohol and other drugs are increasingly present in the lives of university students and may already be considered a public health problem because of the direct impacts on the physical and mental health of these individuals. The requirements of the medical program play a vital role in the increasing rate of drug users.*

OBJECTIVES: *To carry out a systematic review of the literature on the use of drugs, licit or not, in Brazilian medical students.*

METHODS: *A descriptive-exploratory study, in which the SciELO and MEDLINE databases were used. A total of 99 articles were found, of which 16 were selected for this review.*

RESULTS: *Alcohol and tobacco were the most frequently used licit drugs among medical students. The most consumed illicit drugs were marijuana, solvents, "lança-perfume" (ether spray), and anxiolytics. The male genre presented a tendency of consuming more significant amounts of all kinds of drugs, with the exception of tranquilizers. It was found an increasing prevalence of drug consumption in medical students, as the program progressed, which may result from the intrinsic stress from medical school activities. Students who do not use psychoactive drugs are more likely to live with their parents, to disapprove drugs consumption, to practice religious beliefs and to be employed. Conclusion: The prevalence of licit and illicit drug use among medical students is high, even though they understand the injuries it may cause.*

KEYWORDS: *Substance-related disorders. Students, medical. Street drugs. Alcoholism.*

INTRODUCTION

The beginning of medical school is marked by a drastic change in lifestyle¹. The student is subjected to enormous stress levels during the course of their academic training, which triggers deleterious consequences in both social and psychological levels². Among them, is substance abuse, which is used by some students as a means of escape and relief to the problems faced during the program³. These substances activate the neural circuitry of reward and pleasure, allowing for better control of stress and,

therefore, used by students in search of a feeling of well-being⁴.

In fact, several studies have demonstrated there is a high prevalence of alcohol, tobacco, and illicit drug consumption among medical students⁵. The consequences of the excessive use of these substances go far beyond the organic damage already thoroughly described in the literature. Alcohol abuse, for instance, is correlated to an increase in crime, traffic violence, and absenteeism statistics⁶. In addition, the population in general expect medical students to be

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role models of healthy behavior. Upon seeing them making use of such substances, people can be falsely led to believe that drug consumption is a harmless practice and may take it up in daily life.

Hence, substance abuse by medical students may be considered a serious public health matter. Despite that, the situation is often underdiagnosed, since students do not seek expert help and tend to hide the problem⁷. Thus, it is essential to acknowledge the actual prevalence of substance abuse in medical schools. Moreover, it is necessary that the causes for this consumption and the possible measures to mitigate it be clarified and assessed.

The purpose of this paper is to carry out a systematic review of the literature on the use of drugs, both licit and illicit, among Brazilian medical students, seeking to identify what are the most commonly used substances, the main reasons that led to this consumption and the most widely reported risk and protective factors.

METHODOLOGY

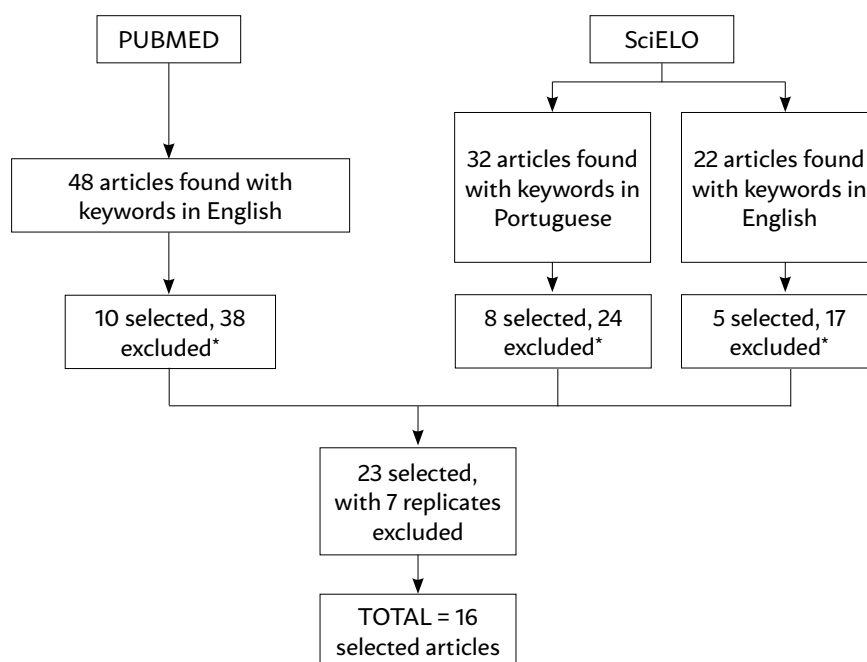
This is a literature review study on the use of licit and illicit drugs by medical students in Brazil. The bibliographical reference used was the Scientific

Electronic Library Online (SciELO) and the Medical Literature Analysis and Retrieval System Online (Medline).

On June 28 of 2017, these portals were accessed and the following combinations of keywords in English were used: “medical students, drugs and Brazil”. A search for references in Portuguese was also carried out using the following combinations of keywords: “*estudantes de medicina e drogas*”. No time limit was set for the studies selected for this review.

The search conducted on Medline with the keywords in English returned 48 references. On SciELO, the search returned 54 references, being 22 with keywords in English and 32 in Portuguese. Out of the total of 102 references found, were excluded all literature reviews, all studies that did not include Brazilian medical students in their samples, and all studies that did not specifically assess drug use. This process led to the exclusion of 79 papers. Out of the remaining 23 references, seven were repetitions and were therefore disregarded as well. Finally, a total of 16 articles were included in this literature review, all of which subsequently read in its entirety. Figure 1 represents the stages for the selection of papers.

FIGURE 1: FLOWCHART FOR ARTICLE SELECTION



*Articles were excluded because they did not evaluate the use of drugs, or Brazilian medical students, or they were review articles.

TABELA 1 – DESCRIPTION OF PUBLICATIONS ANALYZED ON THE USE OF LICIT AND ILLICIT DRUGS BY BRAZILIAN MEDICAL STUDENTS

Year of publication	Sample and type of study	Objectives	Data collection methods	Main achievements
Mesquita et al., 19988	796 of 1,080 students of the Faculty of Medicine of the University of São Paulo (retrospective)	Seek the association between marijuana use and ether sprays (lança perfume).	World Health Organization multiple choice questionnaire.	Male students use ether sprays 1.9x more than female students. Medical students with a history of marijuana use were estimated to use ether sprays 6-7 times more than students who did not use marijuana.
Kerr-Correa et al., 19999	3,725 of 5,225 students enrolled in nine medical programs in the state of São Paulo (retrospective)	Evaluate the use of alcohol and drugs among students from nine different medical programs in the state of São Paulo find the profile of the drugs that are used most often.	Self-administered questionnaire proposed by the World Health Organization.	Alcoholism was considered a health problem by 90% of the students. In descending order, the most commonly used drugs were alcohol, tobacco, solvents, marijuana, tranquilizers, and cocaine, with consumption increasing in the last years of the program. Greater tendency of benzodiazepine use in the final years of the program, due to the ease of access to prescriptions and medication in the hospital, stress at the end of the program and residency exams.
Passos et al., 200610	1,054 medical students from four medical programs in Rio de Janeiro (retrospective)	To estimate the prevalence of psychoactive drug use in four medical programs in Rio de Janeiro and its associated sociodemographic conditions.	Questionnaire used by the World Health Organization.	Alcohol was the most widely used drug (96.4%), followed by tobacco (54.3%), tranquilizers (24.2%), marijuana (20.9%), inhalants (18.4), cocaine (3.4%), LSD (3.3%), amphetamines (1.1%), weight loss drugs (0.9%), and ecstasy (0.4%). A total of 45% of the students know where to get drugs and 62% believe that it is easy to get them.
Boniatti et al., 200711	183 of 318 medical students from the University of Caxias do Sul (retrospective)	Investigate the patterns of psychoactive substance use in medical students.	Questionnaires sent by email. Upon return to class, the questionnaires were returned in an urn.	The most commonly used drugs were alcohol (97.3%), tobacco (54.6%), and marijuana (31.1%). There was no increase in the use of illicit drugs during the course of the program. Living with parents, a harmonious home, disapproval of drug use, and religious practices are variables related to lower drug use.
Di Pietro et al., 200712	456 of 650 students of the medical program of the Faculty of Medicine of the Federal University of São Paulo (retrospective)	Evaluate the use of drugs among medical students and look for associated factors.	A self-administered questionnaire was distributed in classrooms, individually.	The most commonly used drugs were alcohol (76.9%), tobacco (20.4%), and marijuana (16.2%). The consumption of all drugs - with the exception of tranquilizers - was more prevalent in men.
Lemos et al., 200713	404 of 432 students from two medical programs in Salvador (retrospective)	To analyze the local pattern of psychoactive substance use in the academic medical population and contribute to the creation of prevention activities.	Standard self-administered questionnaire proposed by the World Health Organization.	Alcohol (92.8%) and ether spray (46.2%) were the most commonly used drugs. The use of tobacco, ether spray, and tranquilizers increased significantly from the first to the sixth year of the program. The main reason found for drug use was entertainment (57.8%).
Carvalho et al., 200814	465 of 600 medical students of the Faculty of Medical Sciences of Santa Casa de São Paulo (prospective)	To identify risk factors related to sexuality and psychoactive substance use by medical students, in order to organize preventive strategies.	An anonymous, semi-structured questionnaire was used.	The most commonly used drug was alcohol (76.2%), with 46.5% using it at least once a week, 33.5% once a month and 2% daily; 11.1% used tobacco, with an average of 6.4 cigarettes a day. Ether spray was used by 22.6%, 98% at least once a month. Greater use of illicit drugs by men. Increased use of alcohol and tobacco throughout the program. Alcohol consumption is greater to alleviate tension, to share a behavior with colleagues and due to ease of access.
Mesquita et al., 200815	557 of 1,080 students of the Faculty of Medicine of the University of São Paulo (prospective)	To analyze medical students' behavior when faced with drug abuse by colleagues from the academic universe.	Three self-administered questionnaires, focusing on licit and illicit drugs and alcohol, separately.	Faced with cases of alcohol abuse, students tend to intervene in some way. The same is not true for illicit drug cases. Information about the risks of alcohol remains under sociocultural acceptability and this explains why it is the most commonly used drug.
Panduani et al., 200816	303 of 400 students from the Federal University of Uberlândia from the first to the fifth year (retrospective)	To determine the prevalence of alcoholic beverages and cigarettes among medical students.	A self-administered individual questionnaire was distributed in classrooms.	A total of 66.34% of the students interviewed consumed alcoholic beverages. The prevalence increases over the course of the program. Of the interviewed students, 65.17% occasionally drank, 27.86% one to two times a week, 5.97% three to four times a week, and 1% daily. Only 10 students smoked, out of which only 2 smoked from 11 to 20 cigarettes a day.
Tockus e Gonçalves, 200817	88 students of the medical program of the Positivo University (retrospective)	To establish the drugs most commonly used by medical students and the problems related to its use.	Adapted World Health Organization questionnaire, through the university portal.	Alcohol use was more prevalent (70.45%), followed by cigarette (27.3%) and marijuana (10.2%), in the last 3 months. Regarding the use throughout life, prevalence was 78.4% for alcohol, 38.6% for tobacco, 26.1% for marijuana, 21.6% for inhalants, 11.4% for stimulants, and 3.4% for cocaine/crack.
Da Silveira et al., 200818	456 medical students from the Federal University of São Paulo (retrospective)	To identify patterns of drug use among university students in years 1 through 6 of the program to chart prevention strategies.	Anonymous questionnaire, which gathered data on drug use in the past 30 days.	Frequency of drug use by men: alcohol (80.5%), marijuana (25.3%), solvents (25.2%), tobacco (25.2%), amphetamines (3.8%) and tranquilizers (2.9%).

Year of publication	Sample and type of study	Objectives	Data collection methods	Main achievements
Oliveira et al., 2010 ¹⁹	457 students of the Faculty of Medicine of the University of São Paulo (retrospective)	To characterize drug use by medical students at different times.	To compare the pattern of drug use in 1996 and 2001.	Alcohol and tobacco consumption remained stable between 1996 and 2001, but the consumption of illicit drugs increased from 36.1% to 43.8%. Alcohol, tobacco, marijuana, and inhalants were the most commonly used drugs in both periods.
Petroianu et al., 2010 ²⁰	332 of 360 medical students of the Federal University of Minas Gerais (retrospective)	To estimate the prevalence of alcohol, tobacco and narcotic use among medical students.	World Health Organization self-administered multiple choice questionnaire, followed by an interview.	Alcohol use by 85.2% of the students, being 37.7% at least once a week and 0.6% daily, with no difference between genders. Tobacco consumption by 16.3% of students, with 1.5% at least once a week and 3.3% daily.
Rodriguez et al., 2012 ²¹	2876 students from universities in Brazil and other Latin American countries (retrospective)	To observe patterns of drug consumption and multiple drug use and their associated factors.	We interviewed students of the 1st and 2nd years, using 58 questions with the possibility of clarifying doubts.	The use of psychoactive substances during the last year, according to the country: Colombia (66.5%); Brazil (65.1%); Chile (51.1%); Nicaragua (42.6%); Jamaica (29.2%) and El Salvador (18.8%). The most frequent drug associations were alcohol and tobacco, except in Jamaica where they were alcohol and marijuana.
Ribeiro et al., 2014 ²²	289 of 608 students. (retrospective)	To identify the use of antidepressants, adherence and guidance on the medication.	Structured self-report technique. Objective questionnaire.	Of the total, 11.4% stated that they use or have used antidepressants, 72.7% of which reported having had medical follow-up. Anxiety and depression were the most commonly reported reasons.
Silveira et al., 2014 ²³	152 of 156 students from the Pontifical Catholic University of Rio Grande do Sul (retrospective)	To evaluate the prevalence of methylphenidate use in medical students.	Cross-sectional survey through a questionnaire.	Of the total, 34.2% of the students had already used methylphenidate, and 23.02% had used without medical indication. The majority (68.57%) of the students who used it without medical indication did so to improve focus and performance in the program.

RESULTS

Table 1 presents the main data found in the papers analyzed.

After the analysis of all 16 papers, we noticed, in relation to the numbers referring to the last century, an increase in scientific studies conducted on the subject. Regarding where these studies were conducted, most of them (75.0%) were carried out in Southeast cities, with an emphasis in São Paulo where nine studies were performed (56.2%); there were only three studies (18.7% in the South region and only one (6.2%) in the Northeast¹. No publications on the subject were found from the North and Central-West regions.

As for the methodology used, all selected papers were cross-sectional, with 14 (87.5%) being retrospective and only two (12.5%) prospective. Out of that total, 12 studies (75.0%) sought to identify the prevalence of licit and illicit drug use by medical students, as well as the likely predisposing factors and conditions associated with it. The other studies had more specific purposes, such as to assess the link between marijuana and ether sprays (*lança-perfume* in Portuguese) and identify how medical students faced with substance abuse by their peers reacted¹⁵. All data were obtained through questionnaires adapted and validated in Portuguese.

Finally, regarding the use of drugs, the studies found were unanimous in pointing out alcohol as the substance most often consumed by medical students⁸⁻²³. Even though the prevalence of smoking has decreased over the past years, several studies still indicate that

tobacco is the second most used drug^{10,11}. Among the illicit drugs, the most often consumed were marijuana, solvents, ether sprays and anxiolytics.

DISCUSSION

Several studies on substance abuse by medical students were published in the first half of this century¹⁰⁻²⁰. When that number is compared to the number of studies from the last century^{8,9}, it can be noted that the academic community has been giving greater emphasis to this matter over the years. This information indicates the social importance of the subject. The study of drug consumption by medical students, and well as of the reasons that lead to that consumption, allow us to infer relevant information around the psychological stress of the academic environment and the interpersonal relationships that arise from it. This information can be used to improve the curricular approach of medical programs, reducing the number of students who turn to drugs.

Despite the importance of the subject, a shortage of studies was found in some regions of Brazil. While almost all of the articles found were produced in medical schools from the Southeast region^{8-10,12,14-16,18-21}, few data were located from the South and Northeast. Worst still, no data for the Central-West and North regions was observed. That is a worrying scenario, since the small number of studies from these regions makes it impossible for the differences between Brazilian regions to adequately assessed, thus limiting the comparisons between the results found.

In regard to the methodology employed, the fact that all papers¹⁰⁻²³ found were cross-sectional also prevents the actual consequences of substance abuse by medical students to be known, since this model does not allow us to assess the long-term situations of the scenario. In addition, almost all authors, to this moment, investigated mostly the prevalence of drug use in this population^{8,10,12-14,16-18,20-23}. In this context, it is vital that longitudinal studies are carried out to thoroughly investigate the relationship between the students and these substances, seeking to identify what are the actual situations that lead to the use of drugs, the adequate way of handling the problem, and which measures can be adopted to mitigate the use of these substances.

All studies reported that alcohol was the substance most widely consumed by medical students. The prevalence of alcohol consumption in this population ranged from 66.34% to 97.3%. These differences can be explained by the variation in the sample size of each study, as well by the particular differences between the populations assessed - such as in which year of medical school the students were and their social class. Despite that, it is important to report that, even though there is a high prevalence of alcohol consumption, it remained stable between 1996 and 2001¹⁹.

In 1999, Kerr-Corrêa et al.⁹ assessed, in retrospect, the use of drugs in 3,725 medical students and showed that, even though 90% of them understood that alcoholism was a public health issue, 80% of the students in the sixth year classified their link to alcoholism patients as week or bad. That data shows that medical programs are effective in teaching the deleterious consequences caused by alcohol abuse. However, they fail to supply practical and theoretical foundations so that the students can handle these situations appropriately.

Considering that most medical undergraduate students seem to understand the harmful effects of alcohol consumption, the high prevalence of the habit is contradictory. The situation seems to stem from the fact that alcohol is the most socially accepted drug⁹ and, therefore, its consumption is not seen as something that should be discouraged nor assessed by expert health professionals.

For example, even though some students declared that when faced with friends abusing alcohol they felt compelled to personally intervene in the situation, when there was an abuse of any other type of drug these same students judged it was necessary

the intervention of an expert health professional¹⁴. Ergo, the assessed students do not see alcoholism as a problem as dangerous as the consumption of other types of drugs. Thus, they tend to be more permissive with alcohol ingestion.

Despite all that, it is important to note that even though the studies identified a high prevalence of alcohol consumption, the frequency of ingestion was not equally high. Petroianu et al.²⁰, for example, reported that 46.9% of students assessed by him consumed alcohol in rare occasions over the previous year and only 0.6% of them declared to intake it on a daily basis. This data is corroborated by a study by Paduani et al.¹⁶, that affirms that 27.86% of students consumed alcohol once or twice a week, whereas only 1% did so daily.

Even though alcohol intake is not frequent, it is noteworthy that the habit is often associated with the concomitant use of other psychoactive substances, leading to risk behaviors²⁰. The association of alcohol and tobacco, another licit drug, was the most often reported in the literature²².

In fact, tobacco was the second most used drug by Brazilian medical students, but its prevalence also varied considerably among the studies. Passos et al.¹⁰ and Boniatti et al.¹¹, for example, observed that around 54% of the students had used tobacco at some point of their lives, while other authors^{12,17,23} reported lower prevalence of about 20%. Like with alcohol consumption, the difference between the results may be explained by the different number used as a sample in the studies, as well as the socioeconomic level of each participant student. Among the students who smoked, only 3.3% reported to do it daily; the rest claimed to smoke on rare casual occasions over the year²⁰.

It is possible that this low rate of student smokers, when compared to the vast number of drinkers, is due to the several anti-smoking measures employed by the Ministry of Health in recent years. Among them is the creation of laws that forbid smoking in enclosed spaces, that vetoed commercial advertisement of cigarettes and that disclose, as a warning, the harmful effects of smoking.

With respect to illicit drugs, 48.6% of students reported to have used some illicit drug at least once in their life¹¹. In most studies, marijuana was the most commonly used, with a consumption prevalence estimated in 10% to 31%^{11,14,17,20}. This is particularly worrying, since the prior use of marijuana was asso-

ciated with a higher probability of using other illicit drugs. For example, students who made use of marijuana are seven times more likely to become ether-spray users than the general population⁸.

Despite this, the consumption of other substances also showed a significant prevalence. In 2006, Passos et al.¹⁰ assessed 1,054 students and reported that 24.2% had already made use of tranquilizers, 18.4% of inhalants, and 3.4% of cocaine. These results were similar to those found in several other studies^{11,12,23}. Even though the consumption of illicit drugs is lower than that of socially acceptable substances, 45% of the students reported knowing where to buy it and 62% believe it would be easy to buy it, if they so desired¹⁰.

Some studies^{9,11,13-15} sought to understand the reasons that led the students to the consumption of drugs. In the study by Kerr-Correa et al.⁹, out of a total of 3,725 students, 60% were not able to explain the reason for using drugs, whereas 17% did so out of curiosity, and 9.0% for fun. These data differ in the literature. Boniatti et al.¹¹, for example, observed that 39.1% of the 183 students in the study made use of these substances out of curiosity and 31.5% for fun. It is possible that this divergence is due to the different number of participants in each study, since the first one assessed a larger sample than the second. Finally, some studies¹³⁻¹⁵ mentioned the stressful nature of the medical program as an initial cause and motivator for drug consumption. Regardless of the initial reason, friends were most often named as the person who first introduced students to the experimental use of these substances⁹.

Regarding gender, most studies observed that men had a higher tendency to consume all types of drugs, with the exception of anxiolytics and antidepressants, which were most often consumed by females^{9,12-14,21}. Moreover, the use of psychoactive substances tends to begin at an early age, alcohol being the most prematurely used with an average starting age of 14.4 (SD=2.5)¹⁰. According to Passos et al.¹⁰, the average starting age for other drugs are: tobacco (15.6), marijuana (17.4), inhalants (17.7), tranquilizers (18.1) and cocaine (18.5).

Several studies demonstrated that the use of licit drugs, tranquilizers and ether sprays increases over the course of the medical program^{9,13,14,16}. Based on that, it can be deduced that students make use of these drugs as an escape mechanism, suggesting there are stressful factors or triggers within the program.

Among these factors are: the pressure to which the student is subjected, the huge workload, significant amount of work and responsibility, social and family deprivation, the need to handle situations of human suffering and death, tiredness and the search for good academic results²⁴. Nevertheless, it is worth pointing out that all studies analyzed were cross-sectional and, therefore, are not capable of establishing cause and effect relationships between these variables.

Regarding the use of prescription drugs, the prevalence of antidepressant use was of 11.4%²², whereas 23% of students reported having taken methylphenidate without a prescription²³. It is possible that these drugs are used as a way to relieve the stress of upcoming residency tests at the end of the program, as well as a way of handling the extreme work shifts and changes in the sleep/wake cycle.

Finally, the factors related to an increase in the consumption of alcohol and other drugs included: being a male, having a favorable attitude towards the use of alcohol and other substances, and missing classes for no good reason⁹. The factors related to the protection against this type of attitude were: living with parents, not having close links with drug users, disapproving of drug consumption, religious practices and being employed.

CONCLUSION

After analyzing the selected papers, we observed a high consumption of psychoactive substances, despite the medical students' understanding of its harmful effects. Several reasons may contribute to this type of attitude, especially the stress to which they are subjected to during the medical program. However, the absence of longitudinal studies in the literature makes it difficult to comprehend the actual causes of this reality.

Considering the vast number of medical schools in Brazil, it is evident the need to conduct more studies in different regions of the country, especially in the North and Central-West. In addition, we recommend that comparative studies are carried out to follow the students over time so that specific preventive measures and treatments can be made available to them.

STATEMENT OF CONFLICT OF INTERESTS

The authors declare there are no conflicts of interest.

RESUMO

INTRODUÇÃO: O consumo e o abuso de álcool e outras drogas estão cada vez mais presentes na vida dos estudantes universitários, e podem ser considerados problemas de saúde pública pelos potenciais prejuízos acarretados na saúde física e mental. No curso de medicina, as exigências acadêmicas e o estresse têm papel fundamental no aumento do uso de drogas entre os estudantes.

OBJETIVO: Realizar uma revisão sistemática da literatura sobre o uso de drogas, lícitas e ilícitas, em estudantes de medicina brasileiros.

MÉTODOS: Estudo de revisão de literatura, cuja fonte bibliográfica foram os portais de periódicos SciELO e Medline. No total, 99 artigos foram encontrados, dos quais 16 foram selecionados para esta revisão.

RESULTADOS: O álcool e o tabaco foram as drogas mais consumidas por estudantes de medicina. Dentre as drogas ilícitas, as mais frequentemente utilizadas incluem maconha, solventes, lança-perfume e ansiolíticos. O sexo masculino apresentou maior proporção de consumo de todos os tipos de drogas, com exceção de tranquilizantes. Foi encontrado um aumento da prevalência de consumo de drogas ao longo do curso de medicina, o que pode ser resultante do estresse próprio das atividades do curso. Estudantes que fazem menos uso de substâncias psicoativas tendem a viver com os pais, não possuem vínculos próximos com usuários de drogas, desaprovam o consumo de drogas, possuem e praticam crenças religiosas e trabalhar.

CONCLUSÃO: A prevalência de consumo de drogas lícitas e ilícitas entre estudantes de medicina é alta, mesmo eles tendo conhecimento sobre os malefícios que o uso pode causar.

PALAVRAS-CHAVE: Transtornos relacionados ao uso de substâncias. Estudantes de medicina. Drogas ilícitas. Alcoolismo.

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