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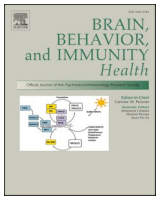

Use of psychoactive substances among university students from 2019 to 2020: A systematic review

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ABSTRACT

Psychoactive substances act on the central nervous system producing changes in mental processes, such as perception, consciousness, cognition or mood and emotions. The present study aims to identify: (i) the most used psychoactive substances, (ii) how psychoactive substances are acquired, (iii) and possible reasons for the use of psychoactive substances amongst university students. A literature search was carried out without language restrictions and included articles published between 2019 and 2020 in journals indexed in the electronic databases of Pubmed and Scielo. The inclusion criteria considered were: (i) original articles, (ii) studies carried out with university students, (iii) providing data on the use of psychoactive substances. 15 studies were included in this review, of which: 4 studies addressed possible reasons that lead to use of psychoactive substances, 10 studies reported usage profile and demographic data, and 1 study addressed how students acquire psychoactive substances. Reasons that led to the consumption of psychoactive substances include: feelings of loneliness after moving away from family; difficulty making new friends; poor academic performance and susceptible environment to acquisition of these substances. In the selected studies, alcohol was identified as the main drug used. In light of the findings reported in this review, new prevention and harm reduction measures can be formulated, based mainly on the reasons that lead to the use of psychoactive drugs, consumption patterns and how the drugs were acquired by university students.

1. Introduction

Psychoactive substances act on the central nervous system producing changes in mental processes, such as perception, consciousness, cognition or mood and emotions. The consumption of psychoactive substances is not a recent phenomenon and has been around since prehistory across a diversity of human cultures. Throughout history, the use of psychoactive drugs has not only been associated with medicine and science, but also magic, religion, culture and recreational use (Tavares et al., 2001; Toscano et al., 2001). Studies show that the main reason individuals start to consume a psychoactive substance is the sensation of pleasure, called positive reinforcement, experienced after its consumption. Thus, individuals increasingly make recreational use of psychoactive substances as an attempt to find relief from the difficulties of day-to-day life or just due to the desire to experience something new (Carvalho et al., 2011; Silva et al., 2014).

Among the different psychoactive substances available, there are legal and illegal drugs. Alcohol and tobacco are considered legal drugs in several countries and are the most widely used drugs associated with substance use disorder in the world (United Nations Office on Drugs and Crime, 2010). Regarding illegal drugs, they are used by 5% of the world population between 15 and 64 years old (approximately 200 million people). Marijuana is the most consumed (162 million people), followed by amphetamines (25 million), opiates (16 million, 11 million of whom are heroin users), cocaine (13 million) and ecstasy (10 million) (United Nations Office on Drugs and Crime, 2006). Some drugs, such as anxiolytics, opioid analgesics and amphetamines are important therapeutic resources of modern medicine. However, due to the worldwide consumption of these legal drugs, they have also become associated with the harmful effects of substance use disorders commonly associated with the use of illicit drugs (Sengik and Scortegagna, 2008).

It has been observed that substance dependence and abuse are statistically related, mainly, when barbiturates, benzodiazepines, opioid analgesics and amphetamines are involved. The consumption of high doses of analgesics, antipyretics and non-steroidal anti-inflammatory drugs (NSAIDs) leads to the appearance of anticholinergic effects, such

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as delusions and hallucinations, which has increased its use as a recreational drug (Silva et al., 1996). Healthcare professionals should be warned about a possible misuse/abuse of a commonly prescribed anti-inflammatory drug and be vigilant when prescribing it, as well as physicians working in emergency units should know that psychotic symptoms may be related to these drugs abuse (Stefania et al., 2021).

Regarding cognitive enhancers, they are increasingly being used among healthy individuals, mainly students without any diagnosed cognitive disorders, to increase their alertness, concentration, or memory, in the belief that these cognitive enhancers will improve their performance during examinations or when studying (Sharif et al., 2021).

The link between an adverse childhood and the susceptibility to substance use disorder has been widely described. A research study shown that the immune system mediates this relationship. This study demonstrated that exposure to psychosocial stress in early life makes permanent changes in the peripheral and central immune system, rendering it more sensitive to immune challenges later in life. Furthermore, the authors also revealed that sensitization to cocaine in early life-stressed individuals also involves brain and peripheral immune responses (Iacono et al., 2018).

Some epidemiological studies have been undertaken in Brazil assessing the prevalence of psychoactive drug use among the university population. Most of them agree that the use of alcohol and other substances is higher among university students when compared to the general population and high school students (Stempliuk et al., 2005). Findings from studies show that the consequences of university students consuming psychoactive substances include car accidents, violence, risky sexual behavior, poor academic performance, decreased perception and stress (Silva et al., 2006). The present study aims to identify: (i) the most used psychoactive substances, (ii) how psychoactive substances are acquired, and (iii) possible reasons for the use of psychoactive substances amongst university students.

2. Methods

The process of completing and reporting this review follows the Preferred Reporting Items for Systematic Reviews and Meta-analysis (PRISMA) guidelines.

2.1. Research and information sources

A review of the current literature on the use of psychoactive substances among university students around the world has been carried out. The electronic databases used were Pubmed and Scielo. The descriptors used were “psychoactive substance AND students”, “illegal drugs AND students” and “psychotropic medications AND students”. These terms were applied to all databases used. This review was completed on April 30, 2021.

2.2. Eligibility criteria

This review was developed without language restrictions and included articles published between 2019 and 2020, to obtain more recent evidence about the use of psychoactive substances before Covid-19 pandemic. The inclusion criteria considered were: (i) original articles, (ii) studies carried out with university students, and (iii) studies providing data on the use of psychoactive substances. Studies that did not meet these criteria as well as retrospective studies or studies with incomplete or missing data were excluded.

2.3. Study selection

To select the articles, an analysis was performed first by title and, later, by abstract, which allowed the exclusion of those articles that did not meet the eligibility criteria. The selected articles were read in full and after that, once they met the criteria, included in this review. The studies were evaluated by two authors (G.R.S. and G.S.L.) independently. In case of disagreement, a third author (D.M.S.) was consulted to resolve inconsistencies.

3. Results

After analyzing the titles and abstracts, 15 articles were included in this review. Fig. 1 shows the stages of the study selection process, the number of studies identified, selected, excluded and included in the review from the electronic databases.

Among the studies included, 4 papers addressed possible reasons that lead to the use of psychoactive substances (Kahsay et al., 2019; Alrakaf et al., 2020; Kusturica et al., 2019; Navarro-Martínez et al., 2020), 10 studies reported usage profile and demographic data (Ajayi et al., 2019; Tesema et al., 2020; Vorster et al., 2019; Colomer-Pérez et al., 2019; Viohl et al., 2019; Font-Mayolas et al., 2019; Grant et al., 2019, 2020; Olano and Wright, 2019; Urday-Concha et al., 2019), and 1 study addressed how students acquire these substances (Bennett and Holloway, 2019). The characteristics of the included studies are shown in Table 1.

4. Discussion

The findings were not affected by the COVID-19 pandemic, as the selected articles were carried out before the pandemic. The COVID-19 pandemic had an impact on every aspect of people’s lives, leading to psychological disorders, alteration in health-related behaviors, and addiction-related problems, including drug/alcohol use. While changes in drug use were closely related to stringent restrictive measures during the 2020 and 2021 lockdowns and subsequent phases of reopening, a lack of control about drinking was observed (Gili et al., 2023).

4.1. Factors that lead to psychoactive substances use

What motivates university students to use psychoactive drugs, has been a topic of much debate over the years. In a study conducted in Ethiopia, the following themes emerged as drivers for the use of psychoactive substances among university students: feeling lonely after moving away from the family; having previous experience with other substances; socialization reasons; poor academic performance; the university environment which made it easier to gain access to substances; and limited recreational activities (Kahsay et al., 2019).

The practice of neuro-reinforcement to improve concentration and increase alertness, often due to academic pressure, were reported reasons for the misuse of stimulating drugs. In Saudi Arabia, a research study reported that the most common reason for misuse of stimulants by many university students involves attempts to prolong study time (Alrakaf et al., 2020). In a study with university students from Bosnia-Herzegovina, the consumption of coffee, energy drinks, nicotine, alcohol and marijuana, for neuro-improvement purpose, increased during the week prior to the exams (Kusturica et al., 2019). Furthermore, a study carried out in Europe investigated the correlation between sleep quality and drug use among university students. Insomnia symptoms were highly prevalent and more common among younger students. Good sleep quality represented a significant protective factor for problematic drug use, on the other hand, the factor “not having a job” represented a greater risk for problematic drug use (Navarro-Martínez et al., 2020).

4.2. Most used substances and standards of use

In the sections below, we will discuss the main findings in relation to consumption patterns of psychoactive substances by continent.

4.2.1. Africa

A study conducted in Nigeria with 784 university students showed

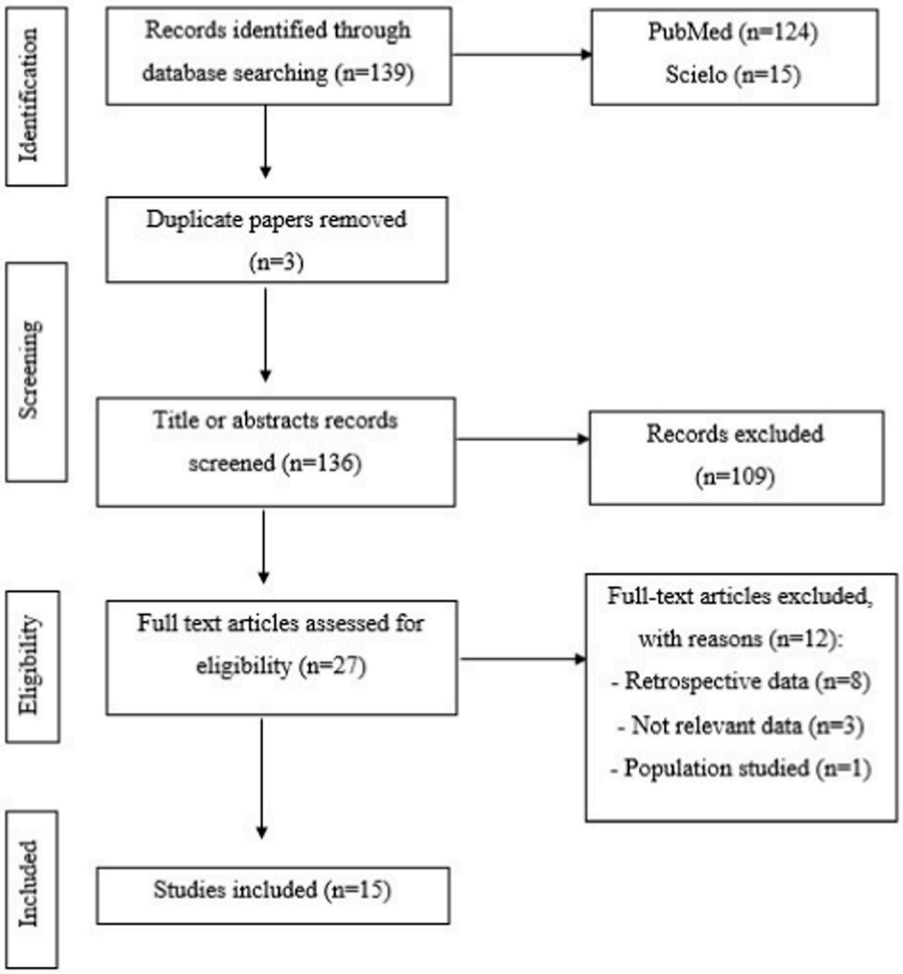

Fig. 1. Prisma flowchart of review results.

that the level of previous alcohol use throughout life (at least once) and current alcohol use was 43.5% and 31.1%, respectively (Ajayi et al., 2019). Another research study from Nigeria, with 1214 undergraduate students participating, shows that lifetime prevalence of psychoactive substance use was 66.5%, while the prevalence in 2017 was 49%. The prevalence of current use was 35.5% for alcohol, 7.8% for tobacco and 5.7% khat. Of the current users, 17% had a moderate to high risk of dependence. Of the students included in this study, 33.5% reported never using psychoactive substances (Tesema et al., 2020).

In South Africa, a study was conducted with 171 medical students; 113 were second year students and 58 were third year students. Alcohol use was reported in 78.4% of second year and 82.8% of third year students. Marijuana use was reported in 22% of second year and 24.1% of third year students. In the second year, 2.7% of students reported using magic mushrooms, 1.8% reported using cocaine, 1.8% reported using ecstasy and only student reported using methamphetamine. Only third-year students reported using LSD or 'crack'. Tobacco use was common in both groups, with 31.5% of second year students and 35.1% of third year students reporting smoking cigarettes (Vorster et al., 2019).

4.2.2. Europe

In a study of 592 students from different European universities, 51.4% of them reported alcohol intake, 16.6% used alcohol and cannabis, 3.7% used alcohol, cannabis and other illicit drugs and 1.6% reported consuming alcohol and other illicit drugs (Colomer-Pérez et al., 2019). A research study on the use of illicit substances with 9351 students from 17 different colleges in Berlin, evaluated different periods of use, and found that 69.3% of the students had used illicit substances throughout life, 45.9% had used them in the last year and 28.3% in the last month (Viohl et al., 2019). In relation to multiple drug use, a study in Spain (968 participants) showed that 44.3% of participants were classified as multi-drug users. The most likely combination was marijuana with cigarettes and/or alcohol. In addition, weekend consumption was higher than during the week, in all types of multiple drug users (Font-Mayolas et al., 2019).

4.2.3. North America

A survey was carried out with 3525 students from a large university in the Midwest. The prevalence of misuse of sedatives/tranquilizers in the last 12 months prior to the survey was 2.1%, with 2.8% of cases reported more than 12 months ago. The misuse of prescribed sedatives/tranquilizers was associated with the use of several other drugs, for example, alcohol, opiates. Those who reported abusing the use of sedatives/tranquilizers were significantly more likely to have mental health problems and engage in risky sexual behaviors (Grant et al., 2020). According to another study investigating the use of hallucinogens with 3525 students, they found prevalence of 4.7% in the last 12 months and 6.4% for more than 12 months. The use of hallucinogens has also been associated with the use of several other drugs, for example, alcohol, opiates, and the development of mental health problems and risky sexual behavior (Grant et al., 2019).

4.2.4. South and Central America

A cross-sectional survey of 250 undergraduate students in the field of

Table 1
General characteristics of the studies included in this review.

Reference/Author	Year	Country	Sample "N"	Main Findings
Kahsay, Tesema and Bazzano (Kahsay et al., 2019)	2019	Ethiopia	41	Main reasons for use are: feeling powerless after the family has left, previous experience with substances and socialization.
Alrakaf et al. (Alrakaf et al., 2020)	2020	Saudi Arabia	1177	The ability to prolong study time has been reported as the most common reason for illicit use of stimulants by students.
Kusturica et al. (Kusturica et al., 2019)	2019	Bosnia-Herzegovina	214	The consumption of psychoactive substances such as energy drinks, nicotine, alcohol and marijuana, for neuro-enhancement purposes, increased during the week before the exams.
Navarro-Martínez et al. (Navarro-Martínez et al., 2020)	2020	European countries	676	Insomnia symptoms were highly prevalent and more common among younger students, who had been studying at the university for less time and had high levels of illicit drug use.
Ajayi, Owolabi and Olajire (Ajayi et al., 2019)	2019	Nigeria	784	Lifetime alcohol use of 43.5% and current use of 31.1%.
Tesema et al. (Tesema et al., 2020)	2020	Ethiopia	1214	Current use of 35.5% for alcohol, 7.8% tobacco and 5.7% khat.
Vorster et al. (Vorster et al., 2019)	2019	South Africa	171	78.4% of 2 nd year students and 82.8% of 3rd year students reported using alcohol
Colomer-Pérez et al. (Colomer-Pérez et al., 2019)	2019	European countries	592	51.4% used alcohol, 16.6% alcohol and cannabis, and 3.7% alcohol, cannabis and other illicit drugs.
Viohl et al. (Viohl et al., 2019)	2019	Germany	9351	High prevalence throughout life (69.3%), in the last year (45.9%) and in the last month (28.3%) of the use of illegal substances.
Font-Mayolas et al. (Font-Mayolas et al., 2019)	2019	Spain	968	20.1% used cannabis plus tobacco and/or alcohol, 17.8% alcohol and tobacco, 5.7% cannabis plus tobacco and/or alcohol, in addition to, at least one, type of illegal drug.
Grant, Lust and Chamberlain (Grant et al., 2020)	2019	USA	3525	The prevalence of misuse of sedatives/tranquilizers in the last year was 2.1%, being associated with the use of several other drugs.
Grant, Lust and Chamberlain (Grant et al., 2019)	2019	USA	3525	The prevalence of hallucinogenic use in the last year was 4.7% and its misuse was associated with the use of several other drugs.
Olano and Wright (Olano and Wright, 2019)	2019	El Salvador	250	28.4% consumed alcohol, 6.5% marijuana and 1.7% cocaine, in the last year.
Urday-Concha et al. (Urday-Concha et al., 2019)	2019	Peru	86	84.4% reported alcohol consumption, 62.8% tobacco and 31.4% consumption of any illicit drug, among which marijuana (17.1%) and cocaine (4.6%) stand out.
Bennett and Holloway (Bennett and Holloway, 2019)	2019	Wales	1877	About half of users obtained drugs only from friends and associates, and 20% obtained them only from external dealers.

social sciences and health sciences in San Salvador, El Salvador, showed that in relation to consumption in the year prior to the survey, 28.4% of the students reported consuming alcohol, 6.5% marijuana and 1.7% cocaine. The study inferred that the use of alcohol, cocaine and marijuana did not affect academic performance of the students (Olano and Wright, 2019).

In Peru, 86 third-year nursing students from a private university in the Arequipa Metropolitan Region, participated in a survey. The results show a high prevalence for the use of legal substances during their whole life, with 84.4% of the students reporting consuming alcoholic beverages and 62.8% smoking tobacco. Regarding illegal drugs, 31.4% reported consuming, in particular marijuana (17.1%) and cocaine (4.6%). Furthermore, in terms of legal drugs tranquilizers were the most commonly reported (19.8%) medicines to be misused among this group of students. In addition, 93% of the students indicated they had received information on the prevention of drug use, and 34.8% reported having had sexual intercourse under the influence of alcohol and illicit drugs several times (Urday-Concha et al., 2019).

4.3. How these substances are acquired

In a survey conducted at seven of nine universities in Wales, students who reported using one or more illegal drug were asked how they obtained their drugs, how they financed their use, whether they sold, marketed or distributed illegal drugs, along with their reasons for trading drugs. The results showed that about half of the users obtained medicines from friends and associates only, and one fifth exclusively from external dealers. One quarter used friends and associates, as well as external markets. In many cases, supplying drugs amounted to sharing them or giving them away. However, over one third of students said that they had sold drugs (Bennett and Holloway, 2019).

5. Limitations

This research is limited to presenting a systematic review of linked studies in two databases and in a specific period, without implementing

a meta-analysis. The need for systematic reviews with meta-analysis is highlighted to estimate a summary measure of the prevalence of psychoactive substance use among university students worldwide. In addition, we did not find studies carried out in Oceania countries that met the inclusion criteria.

6. Conclusions

From the studies reviewed, it appears that alcohol is the most commonly used psychoactive substance used by university students, but the consumption profile for some substances differs across continents. For example, khat is more common used in the African continent; cocaine use is commonly used in South and Central America; hallucinogens and recreational medications, such as sedatives and tranquilizers, are commonly used in North America; while in Europe the combined use of cannabis, alcohol and tobacco is common.

The main reasons found for the consumption of these substances were related to being far away from family, influences from friends, ease of obtaining drugs at university and an attempt to improve academic performance. In this way, the present review emphasizes the need for prevention and harm reduction measures in university environments. In addition, the information reported in this review about the reasons that lead to the use of these substances, consumption patterns and how these substances are acquired, may help in the formulation of new public policies aimed at preventing the abusive use of psychoactive substances and harm reduction in university students.

CRediT authorship contribution statement

Gustavo Reis Sampaio: Conceptualization, Data curation, Writing – original draft. **Gabriel Silva Lima:** Methodology, Validation, Writing – original draft. **Suzana Braga de Souza:** Supervision, Writing – original draft. **Denis de Melo Soares:** Supervision, Writing – review & editing.

Declaration of competing interest

On behalf of all the authors I declare that all of us have none competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Data availability

No data was used for the research described in the article.

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