Original Article

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# ACADEMIC PERFORMANCE AND CONSUMPTION OF ALCOHOL, MARIJUANA, AND COCAINE AMONG UNDERGRADUATE STUDENTS FROM RIBEIRÃO PRETO – BRAZIL

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## ABSTRACT

**Objective:** to determine alcohol, marijuana, and cocaine use, abuse, and dependence, and to identify the association between the use of these substances and the academic performance of undergraduate students.
**Method:** a cross-sectional study with 275 undergraduate students from health and humanities courses at a university in Ribeirão Preto, Brazil. The instruments used were the Questionnaire for Screening the Use of Alcohol, Tobacco and Other Substances and the student's self-report on their performance considering a scale from zero to 10. For analysis, Fisher's Exact Test and Pearson's Chi-square test were used.
**Results:** the pattern of alcohol and cocaine use in the sample studied was similar to the national average; however the prevalence of marijuana abuse was higher than the average. The use of marijuana was associated with the students' academic performance in this study.
**Conclusion:** the same association between abuse of and dependence on marijuana was not identified in the sample studied.

**DESCRIPTORS:** Alcoholic beverages. Cannabis. Cocaine. Students. Universities. Illicit drugs.

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## O DESEMPENHO ACADÊMICO E O CONSUMO DE ÁLCOOL, MACONHA E COCAÍNA ENTRE ESTUDANTES DE GRADUAÇÃO DE RIBEIRÃO PRETO – BRASIL


### RESUMO

**Objetivo:** determinar a prevalência do uso, abuso e dependência de álcool, maconha e cocaína e identificar a associação entre o uso destas substâncias e o desempenho acadêmico de estudantes de graduação.
**Método:** estudo transversal, com 275 estudantes da graduação de cursos da área da saúde e ciências humanas de uma universidade em Ribeirão Preto, Brasil. Utilizou-se o Questionário para Triagem do Uso de Álcool, Tabaco e outras Substâncias e o autorrelato do estudante sobre seu desempenho considerando uma escala de 0 a 10. Para análise utilizou-se o teste Exato de Fisher, o Qui-quadrado de Pearson.
**Resultados:** o padrão de consumo de álcool e cocaína na amostra estudada foi semelhante à média nacional, no entanto a prevalência do uso abusivo de maconha foi superior a tal média. O uso de maconha na vida foi associado à performance acadêmica dos universitários deste estudo.
**Conclusão:** não foi identificada, para a amostra estudada, a mesma associação entre o uso abusivo e dependência de maconha.



**DESCRITORES:** Bebidas alcoólicas. Cannabis. Cocaína. Estudantes. Universidades; Drogas ilícitas.


## EL DESEMPEÑO ACADÉMICO Y EL CONSUMO DE ALCOHOL, MARIHUANA Y COCAÍNA ENTRE ESTUDIANTES DE GRADO DE RIBEIRÃO PRETO – BRASIL


### RESUMEN

**Objetivo:** determinar la prevalencia del uso, exceso y dependencia de alcohol, marihuana y cocaína, e identificar la asociación entre el uso de estas sustancias y el desempeño académico de estudiantes de grado.
**Método:** estudio transversal, con 275 estudiantes de grado de las carreras del área de la salud y las ciencias humanas de una universidad en Ribeirão Preto, Brasil. Se utilizó la Encuesta de Selección del Uso de Alcohol, Tabaco y otras Sustancias, y el autoinforme del estudiante sobre su desempeño considerando una escala de 0 a 10. Para el análisis, se utilizó el test Exacto de Fisher y el Qui-cuadrado de Pearson.
**Resultados:** el padrón de consumo de alcohol y cocaína en la muestra estudiada se acercó a la media nacional; sin embargo, la prevalencia del uso excesivo de marihuana ha sido superior a tal media. El uso de marihuana en la vida se asoció a la performance académica de los universitarios de este estudio.
**Conclusión:** no se identificó, para la muestra estudiada, la misma asociación entre el uso excesivo y la dependencia de la marihuana.



**DESCRIPTORES:** Bebidas alcohólicas. Cannabis. Cocaína. Estudiantes. Universidades. Drogas ilícitas.

## INTRODUCTION

Drug use by young people has substantial short and long-term negative effects on personal development and social adjustment.[1] This consumption is influenced both by macro-social aspects, such as culture, rules, and laws, and micro-contextual aspects, namely, family, peers, and institutions.[2]

In this process, attention is also called to the importance of exposure to risk factors, such as experiencing situations of violence, *bullying*, interaction with gangs, and contexts with drug availability.[2]

Faced with such factors, educational institutions, one of the major sources of social rules, are also considered one of the most important micro-contextual and risk aspects.[2–3]

Admission to the university, as a symbol of educational rise, increases access to better information, contributing to change the perception of risk and to adopt healthier behaviors; however, this new scenario also expands the opportunities of social life and can culminate in different patterns of substance use.[4]

In this sense, the university environment has been described as a predictor of substance abuse, especially alcohol, due to the tradition of drinking in this environment and the development stage of most students. It is worth noting that some students may not stop the consumption at graduation and, in addition to short-term losses, may have serious problems related to abuse or dependence in the future.[5]

Short-term losses are the clinical and psychosocial consequences of the use, with emphasis on changes in sleep patterns, intoxications, accidents and injuries, increased risk of mental health disorders, changes in social adjustment and academic engagement.[3,5–6]

Alcohol and marijuana are the most common drugs in universities, and drug use is one of the most important factors related to poor academic performance and failure to successfully graduate from university.[5]

A series of national and international researches has adopted as object of study the relation between academic performance and use of drugs among students.[6–13] Some researches indicate improvement in performance as motivation to use drugs[10–13] and others describe that substance use is motivated by the desire to reduce negative feelings.[8–9,14]

The previous results also highlight that higher consumption of substances is related to low academic performance, and that higher academic performance is associated with smaller susceptibility to consumption.[7–8] These results were obtained in samples of adolescents and high school students, and it is therefore necessary to analyze if they extend to undergraduate students, in order to enable the creation of strategies/policies for care and prevention of drug use and abuse.

The purposes of this study were to determine prevalence of alcohol, marijuana, and cocaine, use in life and in the last three months, abuse and dependence, and to identify whether there is an association between the use of these substances and academic performance in a sample of undergraduate students of a university in Ribeirão Preto, Brazil.

## METHOD

This study is part of a multicenter project intended to determine the relation between knowledge of consequences, academic performance, and drug use among undergraduates from nine universities in six Latin American countries and two countries in the Caribbean.

Data presented in this article refer to the Brazilian sample concentrated in a university of Ribeirão Preto, Brazil. This is a quantitative approach study, with a cross-sectional design. The study population was undergraduate students of the courses of Information and Documentation Sciences, Law, Nursing, and Occupational Therapy of the abovementioned university (n= 840). The convenience sample consisted of 275 students from the classrooms authorized by the corresponding coordination

of the courses who agreed to voluntarily participate in the research. The inclusion criteria adopted were: to be regularly enrolled and attending these courses during 2014; the exclusion criterion was being younger than 18 years old.

Four nurses with a minimum level of masters' degree were selected and trained to invite the students to participate in the study and instruct them on the ethical aspects and filling in the questionnaires. These nurses went to the classrooms at times authorized by the coordination of the courses and relevant teachers to formally invite the students and to collect data. Those who agreed to participate were collectively guided and an envelope was given with a Free and Informed Consent and questionnaire. The filling took an average of 15 minutes. The questionnaires were not identified and, in order to maintain the participants' privacy, they were asked to put the filled questionnaires and signed consent in an envelope placed on a table in the data collection room.

Data were collected through the Alcohol, Smoking and Substance Involvement Screening Test (ASSIST). This instrument contains eight questions that address frequency, attempts to drop, compulsion, and other use-related problems for each substance. Each answer corresponds to a value that must be summed to obtain the final score. For interpretation purposes, with respect to tobacco and cocaine, scores between 4 and 26 indicate the need for intervention related to the use (indication of abuse), 27 or more (maximum score is 36) indicates the need for more intensive intervention (potential dependence). For alcohol, score between 10 and 26 indicate abuse, and 27 or more, potential dependence.

In this study, only the scores corresponding to the use of alcohol, cocaine, and marijuana were used.[15] Academic performance was measured based on the student's self-report on his/her performance considering a numerical scale from zero to 10. Data were typed twice by two different researchers in a spreadsheet in Excel 2010. The documents were compared and the discrepancies in the answers were reviewed for correction of the final database. Data processing and analysis used the SPSS *software* (*PASW Statistics* 17.0).

Descriptive analyzes, Fischer's exact test (for intersection between academic performance and use of cocaine) and Pearson's chi-square (for all other intersections) were used. The variables considered in the analyzes were prevalence of substance use in life, use in the last three months, abuse and dependence, academic performance (below or above average), year of study (first year or other years), and area of the course (social or health sciences). The significance level of 0.05 was adopted in all analyzes. It is important to note that one student did not answer the performance scale, therefore the association test considered n = 274.

## RESULTS

Most of the participants were female, up to 20 years old, enrolled in the second year or further, lived with friends, and attached high importance to religion.

Regarding academic performance, the average was 7.64 (three as minimum and 10 as maximum; standard deviation 1.091). Most of the students reported above-average performance. The results showed a significant association between the academic performance of undergraduates and the areas and year of study (Table 1).

**Table 1** – Distribution of the participants according to academic performance and socio-demographic variables. Ribeirão Preto-SP, 2014. (n=274)

| Socio-demographic characteristics | Performance – n (%) | | | |
|---|---|---|---|---|
| | Below average | Above average | p-value | Total |
| Gender | | | | |
| Female | 71 (25.9) | 116 (42.3) | 0.107 | 187 (68) |
| Male | 42 (15.3) | 45 (16.4) | | 88 (32) |
| Age | | | | |
| Up to 20 years | 77 (28.1) | 99 (36.1) | 0.258 | 176 (64) |
| Over 20 years old | 36 (13.1) | 62 (22.6) | | 99 (36) |
| Area | | | | |
| Health sciences | 40 (34.5) | 80 (29.2) | **0.019** | 120 (44) |
| Social sciences | 73 (26.6) | 81 (29.6) | | 155 (56) |
| Who they live with | | | | |
| Relatives | 32 (11.7) | 53 (19.3) | 0.559 | 85 (31) |
| Friends | 65 (23.7) | 82 (29.9) | | 147 (53) |
| Alone | 16 (5.8) | 26 (9.5) | | 43 (16) |
| Importance of religion | | | | |
| High | 38 (13.9) | 42 (15.3) | 0.177 | 195 (71) |
| Low | 38 (13.9) | 119 (43.4) | | 80 (29) |
| Current study year | | | | |
| First | 57 (20.8) | 34 (12.4) | **0.000** | 91 (33) |
| Second or more | 46 (16.8) | 127 (46.3) | | 184 (67) |

According to table 2, 87% of the students have used alcohol at some point in their lives, 24% have used marijuana and 2.5% have used cocaine. Regarding the pattern of consumption, it was observed that of the 241 students who have consumed alcohol, 25% abuse this substance. As for illicit drugs, 54% of those who have used marijuana use it abusively and 57% of the cocaine users in the sample also abuse the substance.

**Table 2** – Distribution of the participants according to the pattern of alcohol, marijuana, and cocaine consumption. Ribeirão Preto-SP, 2014 (n=274)

| Patter of consumption | Drugs consumed | | |
|---|---|---|---|
| | Alcohol (%) | Marijuana (%) | Cocaine (%) |
| Use in life | 241 (87.6) | 67 (24.4) | 7 (2.5) |
| Use in the last three months | 229 (83.3) | 50 (18.2) | 4 (1.5) |
| Abuse | 60 (21.8) | 35 (12.7) | 4 (1.5) |
| Potential dependence | 2 (0.7) | 0 (0.0) | 0 (0.0) |
| Never used | 32 (11.6) | 207 (75.3) | 267 (97.1) |

As for the association between drug use and academic performance, there was a significant association only between use of marijuana and the students' academic performance. There was no association between any use of alcohol and cocaine and academic performance (Table 3).

**Table 3** – Use in life and in the last three months of alcohol, marijuana, and cocaine and the academic performance of the participants. Ribeirão Preto-SP, 2014. (n=274)

| Use | Academic performance n (%) | | | |
|---|---|---|---|---|
| | Below average | Above average | p-value | Total |
| In life | | | | |
| Alcohol | 105 (38.2) | 136 (49.4) | 0.059 | 241 (87.9) |
| Marijuana | 35 (12.7) | 32 (11.6) | **0.038** | 67 (24.4) |
| Cocaine | 4 (1.4) | 3 (1.1) | 0.062 | 7 (2.5) |
| Last three months | | | | |
| Alcohol | 100 (36.4) | 129 (46.9) | 0.082 | 229 (83.57) |
| Marijuana | 27 (9.8) | 23 (8.4) | 0.063 | 50 (18.2) |
| Cocaine | 2 (0.7) | 2 (0.7) | 0.755 | 4 (1.5) |

## DISCUSSION

The sample of this study is characterized by a majority of female participants, between 18 and 21 years old, who lives with friends and reported good average academic performance and high degree of importance to religion. From these characteristics, the university context and living with friends stand out as important risk factors,[5,10,16] while being female, having good academic performance, and the importance given to religion are protective factors well documented in the scientific literature.[7,16–18]

Regarding substance use, the prevalence of use in life and in the last three months prior to data collection corroborates other studies of prevalence in the university population.[19–21] However, the prevalence of abuse of marijuana in this study sample (12.7%) was higher than the data of the National Survey conducted in 2010 (8.4%).[22] This result points to the need for additional studies to identify which factors are associated with higher prevalence of this use in the sample studied. On the other hand, the prevalence of abuse of alcohol and cocaine is within the national average, between 16 and 25% for alcohol and 1.8% for cocaine.[22]

It is argued that higher drug consumption is associated with less chances of graduating from university,[9] and greater academic and psychosocial difficulties.[6,17] Based on this statement, it is noted that the non-association between abuse, dependence, and academic performance in this study is certainly due to the fact that there is a low prevalence of this pattern of consumption in the sample studied.

In addition, the fact that the results of this study did not show an association between these variables can also be related to other mediating factors of such association, such as the school history prior to admission to university, education, and socio-demographic profile of the family, or even the satisfaction with the course chosen. Additional investigations are needed to deepen this analysis. In spite of that, analyzes of the association between alcohol, marijuana, and cocaine use and academic performance revealed an association between use of marijuana and academic performance that can be discussed under two angles: the consequences of use of marijuana and the low performance as a risk factor for the use of this substance.

Previous studies have described that the use of illicit drugs is associated with long-term negative outcomes, as well as low performance, school dropout, and reduced professional achievement in adulthood.[5–6,23–25] It is believed that such use is more likely a consequence than a cause of low performance, that is, academic difficulties are likely to contribute to promoting the influence of deviant peers by eliciting rejection through academically successful social networks.[3,6]

Low academic achievement is not the immediate negative effect of the use but rather of a number of other associated factors, such as worse psychosocial, physical and mental health conditions during adolescence and adulthood.[1] On the other hand, a research in New Zealand points out that early and abusive use of marijuana increases the risk of low performance and school dropout.[26] In addition, some American and Spanish researchers also attribute cognitive deficits, academic difficulties, and lack of interest in daily activities to marijuana use.[5,20]

Thus, the distinction between cause and effect of use of marijuana *versus* academic performance is difficult because the use of substances is not an isolated phenomenon, that is, several other factors are implicated in this relation.[2]

The use of alcohol and cocaine, on its turn, was not associated with academic performance among the participants of this study, diverging from other studies conducted with students.[4,8,18,24] In this regard, it is also worth mentioning some controversial results from previous studies that sometimes point to the use of alcohol as a predictor of low academic performance,[8,18,24] and other times point individuals with high performance as more susceptible to higher use of alcohol.[4]

In spite of these controversies, studies on drug use and performance, in their majority,[2–3,5–7,23–24] provide important recommendations related to drug prevention strategies in universities and/or schools, which are reiterated by this study considering the high prevalence of marijuana use in the sample studied. It is understood that educational interventions that improve academic achievement can help prevent drug use, especially illicit drugs, positively impacting multiple aspects of the student's adjustment.[6,23]

The association between academic performance and the variables year and area of course indicated that students of the second year or further studying social sciences presented better academic performance. As for the year, it is suggested that first year students see the adaptation phase to the course and the university environment as an additional challenge to the demands of the course.[4,26–27]

Regarding the area of the course, it is understood that the courses in the health area tend to adopt more traditional evaluation strategies, as well as a practical internship that requires the student to exercise different professional skills and that may interfere in the student's self-evaluation. Further studies are recommended using other variables, as well as a more appropriate collection tool to analyze this question deeply.

As a limitation of the study, the use of self-report for the variable academic performance is highlighted. Although this type of resource preserves ethical aspects of the individuals and the institution, it is also a source of many bias due to different factors related to the individual's perception of their own performance, such as self-esteem, sense of coherence, and self-expectations. In addition, the sample composed only of undergraduate students restricts the findings, that is, it is recommended that additional studies also include postgraduate students, as this shall certainly expand the results and allow a more detailed description of the pattern of consumption in the population of university students.

## CONCLUSION

The prevalence of alcohol and cocaine use in the sample studied was similar to the national average; however, the prevalence of marijuana abuse was higher than the average. Marijuana was the only drug associated with the academic performance of university students in this study. These results open a discussion about the question of experimentation and progression of illicit drug use among these university students and the need for specific prevention strategies for this public.

Additional studies are needed to deeply investigate other mediated variables involved in such association; in addition the adoption of a specific sample of dependent university students and/or abusive users will certainly reveal more deep and general results on the existence or lack of association between such variables, since with the sample adopted it was not possible to infer such result.

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## NOTES

### CONTRIBUTION OF AUTHORITY

Study design: Souza J, Hamilton H, Wright MGM.
Data collect: Souza J.
Data analysis and interpretation: Souza J, Hamilton H, Wright MGM.
Discussion of the results: Souza J, Hamilton H, Wright MGM.
Writing and / or critical review of content: Souza J, Hamilton H, Wright MGM.
Review and final approval of the final version: Souza J.

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### ETHICS COMMITTEE IN RESEARCH

The project was approved by the Ethics Committee of the Centre for Addiction and Mental Health of the University of Toronto, Canada., the Ethics Committee of the School of Nursing of Ribeirão Preto, University of São Paulo, referred the project to the National Research Ethics Committee of the Brazilian National Health Council, Certificate of Presentation for Ethical Appreciation 12663213.2.0000.5393.

### CONFLICT OF INTEREST

No any conflict of interest.

### HISTORICAL

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