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Tobacco use and alcohol consumption associated with sociodemographic factors among college students

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ABSTRACT. The aim of this study was to determine the association between sociodemographic variables and behaviors and the use of tobacco and alcohol among students of the Federal University of Paraná. Risk behavior of 1.599 students was obtained from the *Youth Risk Behavior Surveillance*. The association analysis estimated which college students are more vulnerable to the use of tobacco and alcohol. The subjects who smoked more often were older, unmarried, senior students, residing without family and with low socioeconomic status ($p < 0.05$).Considering alcohol consumption, the subjects were older, male, single, night period students ($p < 0.05$). Excessive alcohol consumption was also more likely among older human sciences students, of the night shift and with low socioeconomic status ($p < 0.05$).

Keywords: smoking, alcohol consumption, students, socioeconomic factors, risk behavior.

Utilização de tabaco e consumo de bebida alcoólica associados a fatores sociodemográficos em universitários

RESUMO. O objetivo deste estudo foi verificar a associação entre variáveis sociodemográficas e comportamentos de utilização de tabaco e consumo de bebida alcoólica em estudantes da Universidade Federal do Paraná. Os comportamentos de risco de 1.599 estudantes foram obtidos por meio do *Youth Risk Behavior Surveillance.* Entre os indivíduos que fumavam, com maior frequência, estiveram os mais velhos, solteiros, formandos, residentes sem a família e baixo nível socioeconômico ($p < 0,05$). Para o consumo de bebidas alcoólicas estiveram os mais velhos, do sexo masculino, solteiros, estudantes do pernoite ($p < 0,05$). O consumo excessivo de bebidas alcoólicas também foi mais provável entre os mais velhos, estudantes de ciências humanas, alunos do noturno e baixo nível socioeconômico ($p < 0,05$). A análise de associação apontou os estudantes mais vulneráveis à utilização de tabaco e bebidas alcoólicas entre universitários.

Palavras-chave: tabagismo, consumo de bebidas alcoólicas, estudantes, fatores socioeconômicos, comportamento de risco.

Introduction

Currently the indiscriminate usage of licit and illicit drugs in the world is discussed as an important public health problem. This behavior is observed in men and women of different age groups, economic classes and social status (USDHHS, 2010; FUHR; GMEL, 2011). Smoking and drinking cause concern due to excessive and frequent use of these products by the general population, and to the legality of the use of these products (USDHHS, 2010).

Regarding smoking, it is estimated that there are currently one billion and 200 million active smokers in the world (WHO, 2013). These estimates are worry is because smoking is responsible for approximately five million deaths each year (USDHHS, 2010). Alcohol intake is more alarming, there are almost two billion alcohol consumers, accounting for 3.8% of deaths and 4.6% of other diseases cases related to this behavior worldwide (WHO, 2013).

Treated as a chronic pandemic, governmental institutions show interest in investigating these inadequate health behaviors, commonly seen in young adults. At this age, this population has increasing access to variety of substances, and the young are in a condition of psychological vulnerability due to the personality development process and to intense exposure to the possibility of experiment these products (RIGOTTI et al., 2005). Many studies demonstrate early involvement of young people with drinking and smoking habits, and the legal character contributes to increased exposure and availability for consumption (ZANINI et al., 2006; SENAD, 2010).

Brazil has approximately 5.8 million students in university. Therefore, the attention focused on this

group seems to be of great importance concerning the consumption of alcohol and tobacco (ZANINI et al., 2006; ALMEIDA; MUSSI, 2006).

The identification of the most predisposed groups, within this population, to the use of these substances may help in the development of strategies and interventional actions against drinking and smoking behaviors. During youth, the individual has influence of their student peers on the attitudes, so it may contribute to the formation of new smokers or drinkers.

Although widely documented in the literature the prevalence of college students users of tobacco or alcohol, most studies present data about the use in a single period and broad time length (for example, the use in past 30 days). Thus, these values cannot express the regularity of the behavior (ALMEIDA; MUSI, 2006; ALMEIDA et al., 2011).

The literature does not show clearly what are the sociodemographic variables associated with regular drinking and smoking among college students, in order to identify the most vulnerable groups. This population presents specific variables that may be related to smoking and drinking. Among these variables are study period (day or night), type of residence, field of knowledge of the course and graduation period (freshmen or seniors students).

Furthermore, studies with representative samples and with strict selection criteria allow the formulation of inferences about the population regarding the results. However, due to the difficulty of implementing this type of research, this problem might be overlooked.

Given the context, the present study aimed to investigate the association between sociodemographic variables and drinking and smoking behavior among college students in a federal institution in Paraná, Brazil.

Material and methods

Population and sampling

This was a descriptive correlational study with college students of the Federal University of Paraná (UFPR), located in Curitiba, a city currently with 1,800,000 million inhabitants. In 2011, the university had approximately 24,000 students enrolled in all periods of undergraduate courses. Of all students, 5,059 were freshmen and 1,582 were seniors, totaling a target population of 6,641 students for the survey.

To determine the ideal size of the sample, the calculator software EpiInfo, developed by the Centers for Disease Control and Prevention (CDC), was used.

Due to the existence of two objectives in the present study, determining smoking and drinking prevalence and assessing the association with other variables, two calculations were performed. The calculation indicated the need of a large sample, in order to ensure representativeness in any situation.

The calculation to determine prevalence used as criteria 95% level confidence, 3 maximum sample error, and 50% estimated prevalence. The minimum required sample was of 921 students. Sample correction was performed due to the study design, with selection by cluster sample, and it was assumed an effect design of 1.5 (deff). With rare exceptions, a higher deff is necessary to correct the sample and values equal to or lower than this are often assumed in researches with this design (CARVALHO; ARAÚJO, 2010; OLIVEIRA-CAMPOS et al., 2012).

The sample used was 20% larger than the minimum estimated due to possible data loss. Given this, the final sample size required to determine prevalence was of 1.565 students.

The sample calculation to determine association between sociodemographic variables and smoking and drinking was performed assuming a 95% confidence level and 80% sample power, and the variable gender was chosen as the exposure factor. It is know that gender is presented as a strong factor related to smoking and drinking and for that, it was chosen to perform the calculation (OKSUZ; MALHAN, 2005; ALMEIDA et al., 2011). The male gender was used as the exposure factor and drinking in the last thirty days as a risk factor. According to references, values of 77% for women who drank in the last thirty days and 84% for men who drank in the same period were adopted (COLARES et al., 2009). The estimated minimum sample size was of 1,032 students. Thus, the first calculation ensures population representation.

Sample selection

The inclusion criterion for the study was being a student enrolled in the first or in the last college year in any of the courses of the UFPR, not to be taking medications regularly and not being pregnant.

The sample composition was performed in multiple stages. The proportion of students enrolled in the first or in the last course year was used; the number of students enrolled in three fields of knowledge (humanities, exact and biological sciences) and the study period (day or night). Full time courses were classified as daytime.

Within each cluster, the classes were randomly selected and evaluated in its entirety, filling the criterion of proportionality previously described.

Instruments and procedures

To identify the variables of this study, questionnaires were completed by students during aclass in a single session. The questionnaires were applied by trained researchers of Centre for Research in Sports and Exercise, Federal University of Paraná.

For the socioeconomic classification of the students the methodology of the Brazilian Association of Research Companies (ABEP, 2008) was applied. In this method, the subject indicates the amount of items they possess (television, radio, bathroom, car, house cleaner, washing machine, VCR/DVD, refrigerator, and freezer). The subject should also indicate the degree of education of the head of the family.

Scores were assigned to the amount of each item owned and the sum accounted for socioeconomic classification according to the instrument criteria. This method divides the status as A1, A2, B1, B2, C1, C2, D and E. However, for methodological simplification of classification and analysis, students classified as A1, A2, B1 and B2 were named High socioeconomic status, and those classified as C1, C2, D and E as Low socioeconomic status. For sociodemographic characteristics, information was collected about marital status, gender, study period (day or night), field of knowledge (humanities, exact or biological sciences), and type of residence were the individual lives (with parents and siblings, other relatives, spouse and children, student house or living alone). To simplify the data analysis about residence type, they were categorized as live (or not) in the family home with parents or spouse and children.

The dependent variables used in the study were smoking and alcohol consumption behaviors. These behaviors were obtained through specific issues contained in the YRBS (Youth Risk Behavior Surveillance - College), developed by CDC (Centers for Disease Control and Prevention). This instrument was previously validated and used in another study with Brazilian college students (GUEDES; LOPES, 2009).

To categorize the smoking behavior, students were asked about how many days (from the last thirty) they had smoked. Students who smoked during this period were classified as smokers. For the analysis, continuous values were categorized as those who smoked between one and 10 days, 11 and 20 days, and 21 and 30 days in the last 30 days.

Regarding alcohol use, students were asked how many days (from the last thirty) they drank, and how often were consumed five or more drinks on the same occasion (binge drink). Students who drank during this period were classified as drinkers. The continuous variables were categorized as those who drank between one and 10 days, 11 and 20 days, and 21 and 30 days in the last 30 days.

This study was approved by the Research Ethics Committee with human beings of the Health Science department of the Federal University of Paraná. The research followed the resolution 196/1996 of the National Health Council, and was registered as CEP/SD: 1043.168.10.11.

Statistical analysis

Data were entered in the software Excel (Microsoft Office 2010) and transferred to the statistical package SPSS 17.0.

Data normality was tested using the Kolgomorov-Smirnov test. Frequency distributions were performed for prevalence analysis of sociodemographic variables, smoking and drinking behaviors. The prevalence ratio (PR) was used to examine the association between sociodemographic factors and smoking and drinking behaviors by Poisson regression with robust variance. All variables with association higher than $p < 0.20$ were accepted to compose the adjusted model, as suggested by previous studies (VICTORIA et al., 1997; SIQUEIRA et al., 2009). The established significance level for analyzes was $p < 0.05$.

Results

At the end of the survey, 1,631 students were assessed, proportionally distributed among freshmen and senior students, among the three fields of knowledge (humanities, exact and biological sciences), and among study period (day and night).

After exclusion of 32 questionnaires with incomplete or inadequate responses (1.97%), the final sample consisted of 1,599 students, 1,197 (74.86%) freshmen and 402 (25.14%) seniors.

Table 1 presents prevalence and 95% confidence of interval values of sociodemographic factors and smoking and drinking behaviors among college students.

The association between variables was performed the adjustment of analyzes. After this process, the variables age, gender, marital status, type of residence and socioeconomic status remained in the regression model for smoking behavior. Only the variables field of knowledge and daytime classes were not associated with smoking.

Table 2 presents the association between sociodemographic factors and the smoking behavior according to the frequency categories.

Table 1. Prevalence of sociodemographic factors, smoking and drinking.

Variable	N	Prevalence	CI – 95%
Age (years)			
≥ 20	847	53	50.3 – 55.4
Gender			
Male	788	49.3	46.8 – 51.8
Marital status			
Married	114	7.1	5.8 – 8.3
Course period			
Senior students	402	25.1	23 – 27.2
Field of knowledge			
Exact	650	40.7	38.1 – 43.2
Humanities	564	35.3	32.9 – 37.7
Biological	385	24	22 – 26.2
Study period			
Night	436	27.3	25 – 29.5
Residence type			
No house family	492	30.8	28.6 – 33.1
Socioeconomic status			
Low	391	24.5	22.4 – 26.6
Smoking			
1 to 10 days	71	4.5	3.5 – 5.5
11 to 20 days	24	1.5	0.9 – 2.1
21 to 31 days	69	4.3	3.4 – 5.4
Drinking			
1 to 10 days	813	54	51.4 – 56.4
11 to 20 days	126	8.3	7.1 – 9.7
21 to 31 days	18	1.2	0.7 – 1.7
Binge drink			
1 to 10 days	606	37.9	35.4 – 40.2
11 to 20 days	34	2.1	1.5 – 2.9
21 to 31 days	03	0.2	0.1 – 0.4

CI: Confidence Interval.

Table 2. Adjusted association model of sociodemographic factors and smoking.

Variables	Last 30 days	1 to 10 days	11 ato 20 days	21 to 30 days
Age (years)		PR (CI 95%)		
≥ 20	2.1 (1.53 – 2.88)	0.96 (0.52 – 1.72)	1.28 (0.38 – 3.1)	6.58 (4.21 – (7.24)
≤ 20	1	1	1	1
Gender				
Male	1.73 (1.29 – 2.33)	2.1 (1.32 – 3.27)	1.12 (0.51 – 2.38)	1.44 (0.88 – 2.12)
Female	1	1	1	1
Marital status				
Single	1.51 (0.89 – 2.55)	0.77 (0.61 – 1.9)	0.96 (0.17 – 4.1)	2.55 (1.37 – 3.8)
Married	1	1	1	1
Course period				
Senior students	1.19 (0.86 – 1.65)	2.1 (1.33 – 3.1)	1.2 (0.8 – 3.12)	1.73 (1.15 – 2.61)
Freshman	1	1	1	1
Field of knowledge				
Exacts	1.32 (0.9 – 1.93)	1.13 (0.98 – 1.25)	2.74 (0.79 – 3.81)	0.72 (0.32 – 1.58)
Humanities	1.22 (0.81 – 1.83)	0.98 (0.87 – 1.25)	1.59 (0.41 – 6.1)	1.41 (0.82 – 2.31)
Biological	1	1	1	1
Study period				
Night	1.1 (0.75 – 1.45)	0.71 (0.41 – 1.2)	0.72 (0.28 – 1.72)	1.43 (0.87 – 2.22)
Day	1	1	1	1
Residence type				
No family home	1.59 (1.18 – 2.14)	1.68 (1.11 – 2.61)	1.11 (0.41 – 3.2)	1.74 (1.41 – 2.71)
With family	1	1	1	1
Socioeconomic status				
Low	1.02 (0.74 – 1.41)	0.79 (0.49 – 1.29)	0.94 (0.38 – 2.51)	1.64 (1.13 – 2.61)
High	1	1	1	1

PR: Prevalence Ratio; CI: Confidence Interval.

Among the categories that represent higher frequency of alcohol consumption (between11 and 20 days, 21 and 30 days from last thirty), the association was higher with age, gender, marital status, being a freshman or a senior student, and classes daytime.

Older students, male, single, seniors, with night time classes presented a higher probability to alcohol consumption in two larger frequency categories.

Table 3 presents the association between sociodemographic factors and the alcohol consumption, according to the frequency categories.

Table 3. Adjusted association model of sociodemographic factors and drinking.

Variables	Drinking in the last 30 days	Drinking between 1 and 10 days	Drinking between 11 and 20 days	Drinking between 21 and 30 days
Age (years)		PR (CI 95%)		
≥ 20	1.06 (0.97 – 1.17)	1.04 (0.93 – 1.16)	1.09 (0.66 – 1.8)	3.4 (1.24 – 6.23)
≤ 20	1	1	1	1
Gender				
Male	1.11 (1.04 – 1.19)	1.02 (0.93 – 1.18)	1.91 (1.32 – 2.7)	3.74 (1.29 – 7.31)
Female	1	1	1	1
Marital status				
Single	0.75 (0.64 – 0.91)	1.19 (1.12 – 1.43)	1.72 (0.78 – 2.4)	3.21 (2.1 – 5.82)
Married	1	1	1	1
Course period				
Senior students	1.19 (1.11 – 1.31)	1.19 (0.86 – 1.65)	2.81 (2.1 – 3.87)	1.56 (0.78 – 5.63)
Freshman	1	1	1	1
Field of knowledge				
Exacts	1.13 (0.95 – 1.35)	1.12 (1.05 – 1.26)	1.68 (0.92 – 2.31)	1.61 (0.43 – 3.23)
Humanities	1.21 (1.09 – 1.43)	1.19 (1.11 – 1.33)	1.43 (0.87 – 2.11)	1.54 (0.65 – 4.21)
Biological	1	1	1	1
Study period				
Night	1.02 (0.88 – 1.18)	1.1 (0.75 – 1.45)	0.92 (0.64 – 1.35)	3.55 (1.12 - 7.82)
Day	1	1	1	1
Residence type				
No family home	1.19 (1.10 – 1.29)	1.20 (1.11 – 1.32)	1.17 (0.79 – 1.72)	1.38 (0.68 – 3.65)
With family	1	1	1	1
Socioeconomic status				
Low	1.17 (1.07 – 1.29)	1.14 (1.08 – 1.27)	1.29 (0.82 – 1.91)	2.46 (0.89 – 4.44)
High	1	1	1	1

PR: Prevalence Ratio; CI: Confidence Interval.

Regarding binge drink, the variables daytime study, residence type, being a freshman or a senior student, fields of knowledge and socioeconomic level presented association with the two larger frequency categories.

The older students, in nighttime classes, residing without family, seniors, coursing human sciences, and with low status level were more vulnerable to binge drink.

Table 4 presents the association between sociodemographic factors and the binge drink according to the frequency categories.

Table 4. Adjusted association model of sociodemographic factors and binge drink.

Variables	Binge drink last 30 days	Binge drink between 1 and 10 days	Binge drink between 11 and 20 days	Drinking between 21 and 30 days
Age (years)		PR (CI 95%)		
≥ 20	1.05 (0.9 – 1.23)	1.03 (0.87 – 1.21)	1.38 (0.51 – 3.6)	2.27 (1.15 – 4. 81)
≤ 20	1	1	1	1
Gender				
Male	1.39 (1.22 – 1.57)	1.39 (1.22 – 1.59)	1.46 (0.71 – 3.1)	1.47 (0.45 – 6.11)
Female	1	1	1	1
Marital status				
Single	0.39 (0.27 – 0.57)	1.37 (0.56 – 6.12)	1.88 (0.33 – 6.87)	3.96 (0.95 – 8.88)
Married	1	1	1	1
Course period				
Senior students	1.49 (1.28 – 1.73)	1.44 (1.27 – 1.63)	4.1 (2.13 – 7.8)	3.41 (0.77 – 7.3)
Freshman	1	1	1	1
Field of knowledge				
Exacts	0.88 (0.73 – 1.05)	0.92 (0.76 – 1.11)	2.55 (0.85 – 6.7)	2.96 (0.24 – 8.66)
Humanities	1.07 (0.93 – 1.23)	1.08 (0.92 – 1.24)	3.55 (1.28 – 7.42)	1.25 (1.12 – 9.21)
Biological	1	1	1	1
Study period				
Night	1.01 (0.88 – 1.18)	1.08 (0.92 – 1.26)	2.95 (1.69 – 7.11)	3.96 (2.05 – 7.86)
Day	1	1	1	1
Residence type				
No family home	1.27 (1.12 – 1.45)	1.30 (1.13 – 1.49)	2.96 (1.19 – 6.32)	4.9 (0.36 – 8.81)
With family	1	1	1	1
Socioeconomic status				
Low	1.16 (1.03 – 1.34)	1.32 (0.68 – 2.1)	1.68 (0.66 – 4.1)	2.54 (1.12 – 5.57)
High	1	1	1	1

PR: Prevalence Ratio; CI: Confidence Interval.

Discussion

Defining the characteristics of individuals who are more likely to deleterious health behaviors, such as smoking and drinking, may assist in taking preventive attitudes and manage such habits.

This study presents the sociodemographic variables most related to the smoking and drinking behaviors among college students. It is known that smoke in any quantity is not a healthy behavior. The main attention should be given to the frequency that the act occurs, with the intention to avoid the condition of dependence (USDHHS, 2010). Regarding smoking frequency during the last month, it was observed that regular behavior (between 21 and 30 days) was more prevalent among older students, single, graduate, those who live outside the family home, and those with lower socioeconomic status. Surprisingly, the gender variable was not associated with smoking in this category. Differently from the result of this study, several researches that examined this relationship demonstrate greater presence of smokers among male students (OVIEDO et al., 2008; DAWSON et al., 2007; FRANCA; COLARES, 2008).

Despite the result found to gender, the other associations observed are supported by the literature. In a study conducted with a representative sample of college students from a Spanish university, Gil-Garcia et al. (2013) presented protective association for the use of tobacco among younger students compared to the older. Similar result was found in another Brazilian study (JÚNIOR et al., 2009).

The fact is that students of 20 years or more were the most likely regular smokers. This may be related to high rate of smoking among senior students. It is suggested that exposure to events that favor the acquisition of the behavior, such as parties and university meetings, coupled with the need for self-assertion among their peers may influence the acquisition and maintenance of this behavior (RIGOTTI et al., 2005). According to some authors, senior students are more likely to present high levels of stress and anxiety. It is known that this condition is associated with the use of substances that purport to diminish the diseases associated (SANTOS et al., 2003; BARBOZA; SOARES, 2012).

Senior students, due to the longer permanence in university, have contact with a larger numbers of students, and this favors the possibilities of participating in these events, which makes them more vulnerable than freshmen (RIGOTTI et al., 2005).

Living outside the family home is presented as a facilitator to health risk behaviors. Students who leave home to study, who stay away from their parents, may have greater sense of freedom in relation to new experiences and curiosities such as the use of licit and illicit drugs (POLYMEROU, 2007).

The consumption of alcohol during college represents an important public health problem (SENAD, 2010). The drink behavior is observed in a large proportion of this population (O'GRADY et al., 2008; VANKIM et al., 2010). In addition to the various risks to individual health, this habit is associated with other risk behaviors, such as dangerous driving, unprotected sex, and use of other drugs (O'GRADY et al., 2008; GRUENEWALD et al., 2010; PÉREZ; VALLEJO, 2012; GIL-GARCIA et al., 2013).

This study presents the regular profile of drinkers, the older students, single, seniors and nighttime students. This information demonstrates a behavior that predisposes binge drink (VANKIM et al., 2010). Other studies have used this variable without the worry about the amount of drinks on the same occasion (FRANCA; COLARES, 2008; SENAD, 2010). It is necessary to be careful when

analyzing data related to drinking, because the consumption of a small daily dose may not necessarily represent risk to health and to promote cardiovascular health. In this perspective, the most important variable related to alcohol consumption among college students is binge drink (WHO, 2007).

Regarding to binge drink, the more likely groups in this study were formed by men, older, senior students, humanities students, nighttime students, individuals living outside the family home, and those with lower socioeconomic status.

In a large survey of the behavior of Brazilian university students, conducted in 27 Brazilian cities, with 12,711 individuals, the National Policy Anti-drugs Department presented results concerning the behavior of binge drink similar to the present study (SENAD, 2010). It was revealed that among students between 18 and 24 years, the older students participated of binge drinking episodes more often than the younger ones.

Approximately 31% of men performed binge drinking in the last thirty days, while 20% of the women related the same. In a study with North American college students, Vankim et al. (2010) presented a higher binge drinking frequency for senior students (40%) compared to college sophomores (31%) in 15 days preceding the survey. Another national study reported that students who live outside the family home presented up to 10 times higher chance to drink alcohol (RAMIS et al., 2012).

It is interesting the fact that studies that have also examined the relationship between socioeconomic status and field of knowledge presented results contrary to the ones presented here (COLARES et al., 2009; RAMIS et al., 2012). These contradictions suggest that more research is demanded to explore the factors associated with drinking by college.

Moreover, it is important to consider other important sociodemographic factors such as the habit of drinking before undergraduation period, location of the university (if it is located within the city, surrounded by pubs, and the population that frequents these places), and frequency of festivities for students.

It is also important to mention that research methods and cutoff values for this variable are many and there is no consensus among studies in this perspective, undermining conclusions about the results.

The drinking behavior, especially the binge-drinking factor, is widely studied in the population of college students. However, little is found in literature about strategies to try to reduce this behavior. White et al. (2009) exposed important results on the control of the amount of alcohol consumed by students using the simple attitude of contacting them by email periodically for three years. Actions of this type may favor the biological health of the students and also the prevention of risk behaviors.

This study had some limitations. The results are restricted to the population of students from a single location, so it is not possible to infer about students from other universities. Another limitation was about the measure of consumption in days per month, without regard to quantity per occasion. The measure instrument does not present the amount used daily. This implies, for example, to equate individuals who smoked a few cigarettes with those who smoked an entire packet. As well as those who drank even a single dose with those who drank various doses on the same occasion.

Although the present study has presented some limitations, the sample was representative and rigorously selected, which allowed the identification of a tendency to deleterious health behaviors by the students, regardless of the amount of tobacco and alcohol use per occasion.

Conclusion

Given the results, it is possible to demonstrate the groups of students most vulnerable to smoking and alcohol consumption.

The students identified as most vulnerable to smoking were older students, single, seniors, residing without family and with low socioeconomic status. Those most likely to drinking were older, men, single and nighttime students. Finally, the most likely to binge drinking behavior were the older students, humanities students, those studying at nighttime and those with low socioeconomic status.

Despite these behaviors (especially drinking) are observed mainly outside around the university, the interventions against these behaviors could be more expressive within universities. Risk behaviors to student health can affect their social and academic performance. In this context, it is important that the university take the responsibility of educating students about health issues that can be placed beyond the undergraduate period.

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