Self-medication among undergraduate students from the countryside of Amazonas

Automedicação entre estudantes de graduação do interior do Amazonas

Automedicación entre estudiantes universitarios del interior del estado de Amazonas

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Abstract

Objective: To estimate the prevalence and factors associated with self-medication among undergraduate students in the countryside of Amazonas.

Methods: Cross-sectional study with a total of 694 students from a public university in the countryside of Amazonas, between March and July 2018. Self-medication was defined as the use of at least one medication without a prescription. Odds Ratio (OR) and 95% Confidence Intervals (95% CI) were estimated by Logistic Regression.

Results: Of the 694 undergraduate students, 483 indicated drug use. Of these, 80.1% reported self-medication. Analgesics were the most used (51.8%) and the reasons that most led to self-medicating were pain problems (54.3%). The variables "having children" (OR: 1.83; 95% CI: 1.06-3.16) and "having the practice of recommending medication to other people" (OR: 2.38; 95% CI: 1.47 -3.86) remained independently associated with self-medication.

Conclusion: There was a high prevalence of self-medication among students, highlighting the need for discussion about the rational use of medication in the university environment.

Resumo

Objetivo: Estimar a prevalência e fatores associados à automedicação entre estudantes de cursos de graduação do interior do Amazonas.

Métodos: Estudo transversal com 694 estudantes de uma universidade pública do interior do Amazonas, entre março a julho de 2018. Definiu-se automedicação como uso de, no mínimo, um medicamento sem prescrição. Estimaram-se *Odds Ratio* (OR) e Intervalos de Confiança de 95% (IC 95%) pela Regressão Logística.

Resultados: Dos 694 graduandos, 483 indicaram consumo medicamentoso. Destes, 80,1% referiram automedicação. Os analgésicos foram os mais utilizados (51,8%) e os motivos que mais levaram a se automedicarem foram os problemas álgicos (54,3%). As variáveis "ter filhos" (OR: 1,83; IC 95%: 1,06-3,16) e "ter a prática de indicar medicamentos para terceiros" (OR: 2,38; IC 95%: 1,47-3,86) permaneceram independentemente associadas à automedicação.

Conclusão: Observou-se alta prevalência da automedicação entre os estudantes, evidenciando a necessidade de discussão sobre o uso racional de medicamentos no ambiente universitário.

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Conflicts to interest: none to declare.

Resumen

Objetivo: Estimar la prevalencia y factores asociados con la automedicación entre estudiantes de cursos universitarios del interior del estado de Amazonas.

Métodos: Estudio transversal con 694 estudiantes de una universidad pública del interior del estado de Amazonas, entre marzo a julio de 2018. Se definió la automedicación como el uso de, como mínimo, un medicamento sin prescripción. Se estimaron *Odds Ratio* (OR) e Intervalos de Confianza del 95 % (IC 95 %) por Regresión Logística.

Resultados: De los 694 estudiantes universitarios, 483 indicaron un consumo medicamentoso. De estos, 80,1 % mencionaron automedicación. Los analgésicos fueron los más utilizados (51,8 %) y los motivos que más llevaron a la automedicación fueron los problemas álgicos (54,3 %). Las variables "tener hijos" (OR: 1,83; IC 95 %: 1,06-3,16) y "tener la práctica de indicar medicamentos a terceros" (OR: 2,38; IC 95 %: 1,47-3,86) permanecieron independientemente asociadas a la automedicación.

Conclusión: Se observó alta prevalencia de automedicación entre los estudiantes, evidenciando la necesidad de discusión sobre el uso racional de medicamentos en el ambiente universitario.

Introduction

Medicines are essential pharmaceutical products for health, technically produced with the purpose of preventing, healing, controlling, alleviating and diagnosing diseases and their symptoms.[1] Among the forms of drug consumption, self-medication stands out, which can be considered such as the use of medications on their own initiative to treat self-recognized health problems.[2]

The risks of self-medication are numerous, involving drug interactions, intoxication, disease masking and even death,[3] and may be linked to the individual's previous experience with the drug, the availability of drugs in homes and the ease of purchase in pharmacies.[4]

In this context, the practice of self-medication has been widely studied in different countries,[4-9] and age groups (older adults,[10] adults,[11] children and adolescents,[12] health professionals[13] and university students.[14] In them, some studies indicate that the knowledge acquired during the undergraduate course can influence this practice.[15,16]

International studies carried out between 2014 and 2015 reveal high rates of self-medication among university students, with values ranging from 50.9% to 96.0%.[5-9] In Brazil, self-medication rates among university students ranged from 76.0 % to 100% in studies carried out between 2009 and 2017.[14,15,17-20] In the analysis by regions of the country, most studies are concentrated in the Southeast and South regions, with a lower proportion of investigations in the North region. In a study conducted with a total of 342 university students in Santa Catarina in 2009, South region, it was identified that the prevalence of self-medication was 96.5%.[15] In the Southeast, among 768 undergraduates investigated in Sao Paulo between 2016 and 2017, the prevalence was of approximately 90%.[14] In the Midwest Brazil, specifically in the city of Goias, investigating 133 students in 2016, the prevalence was 90.8%.[17] In the Northeast, Vitoria da Conquista – with 189 participants, the proportion was 95.8% in 2017.[18] In the North region, in Manaus – the capital of Amazonas, authors estimated a prevalence of 89% among 180 students,[19] while another investigation carried out in 2014 with 116 nursing students in the country side of the state, it found a prevalence of 76.0%.[20]

The literature has pointed out that different factors may be associated with the practice of self-medication among undergraduate students in Brazil, highlighting the variables gender,[15] influence of advertisements, old prescriptions, indications to other people, self-knowledge[15] and ignorance of risks of this behavior.[20] However, these factors need to be further explored.[15,16]

Given the above, considering the relevance of the theme and the high rates of self-medication among undergraduates in different regions of the country, this study was justified by the need to know this behavior among university students in more remote areas, such as the countryside of the state of Amazonas. Thus, the study aimed to estimate the prevalence and factors associated with self-medication among undergraduate students in the countryside of Amazonas.

Methods

This is a cross-sectional and analytical study, carried out with students from the countryside of

Amazonas, regularly enrolled in undergraduate courses at the Instituto de Saude e Biotecnologia (ISB) of the Universidade Federal do Amazonas (UFAM), between March and July 2018.

The ISB is located in the city of Coari, in the countryside of Amazonas, which is only accessible by river or air, and is 363 km from the capital – Manaus. The Institute offers seven on-site undergraduate courses: Nutrition, Science: Mathematics and Physics, Biotechnology, Science: Biology and Chemistry, Physiotherapy, Nursing and Medicine.

It is noteworthy that the Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) was used to guide the methodology of this study.[21]

For the sample calculation, the 992 students enrolled in the seven undergraduate courses offered by the ISB/UFAM in the first semester of 2018 were considered – period of data collection for the study. Thus, we opted for a non-probabilistic sampling by quota, calculated proportionally by course and considering 70% of each, resulting in the following proportions: [1] Science: Biology and Chemistry, total of 183 enrolled (n = 128); [2] Science: Mathematics and Physics, total of 142 enrolled (n = 99); [3] Biotechnology, total of 110 enrolled (n = 77); [4] Nursing, total of 194 enrolled (n = 136); [5] Physiotherapy, total of 162 enrolled (n = 113); [6] Medicine, total of 37 enrolled (n = 26); [7] Nutrition, total of 164 enrolled (n = 115). Thus, the final sample totaled 694 participants.

The study inclusion criteria were: being at least 18 years old, both genders, being properly enrolled in the undergraduate course and having attended university during the current period of the study. The exclusion criteria were: indigenous students (due to the formalities and bureaucracy to carry out studies with the public plus a maximum period of 1 year to complete the research) and students absent after three attempts to collect data in the classrooms.

Data collection took place between March and July 2018, using a previously tested self-administered questionnaire (pilot with 30 students, no adjustment to the instrument was necessary and the participants' data were used in the study sample). Students were approached in the classroom, after consent of the responsible teacher at the time, during breaks from classes, or on the university premises. The questionnaire was composed of socioeconomic and demographic variables, self-reported diseases and information related to medication consumption.

The dependent variable was the practice of self-medication, which was evaluated by the use of at least one medication without a doctor's or dentist's prescription, in the last 30 days,[22] being classified in a dichotomous way (yes, no).

The independent variables were demographic (gender, age group), socioeconomic (marital status, having children, living with someone, monthly family income), academic (course area, course, semester) and on medications (storage of medications at home, reading the medicine instructions, thinking that medicines cause health risks, recommends medicines to other people).

Data were stored in the Statistical Package for Social Sciences (SPSS) version 20.0, with double data entry. Allopathic drugs were classified using the Chemical Therapeutic Anatomical Classification (CTA) – (*ATC*) system (only level 2) of the World Health Organization (WHO) was used.[23] For the grouping of health reasons that led to self-medication, we used the International Classification of Diseases, version 10 (ICD-10).[24]

Participants were characterized using absolute and relative frequencies of independent variables, according to the adoption of self-medication. In the bivariate analysis, Pearson's chi-square test was conducted. All variables that showed an association with a significance level lower than 20% ($p < 0.20$) in the bivariate analysis were included in the multivariate model. The Stepwise Forward method of variable input was used.

The Odds Ratio (OR) was estimated and their respective 95% confidence intervals (95% CI) from multivariate logistic regression. To determine the quality of adjustment of the variables in the final model, the values of the Hosmer and Lemeshow test were observed. At this stage, the significance level of 5% was considered.

The study was approved by the Research Ethics Committee of the Universidade Federal

do Amazonas and registered under CAAE 749197171000005020. Students who consented to participate in the study were given the Informed Consent Form for signature in duplicate.

Results

Of the 694 students who answered the questionnaire, 69.6% (n=483) reported some medication use. Among the 483, 80.1% (n=387) indicated self-medication in the last 30 days; and 19.9% (n=96) reported that the medications used were prescribed by a professional. The sociodemographic, academic and behavioral characteristics related to the medications of the participants according to the practice of self-medication are presented in table 1. Compared to the participants who did not report self-medication, those who had children, who read the package inserts and those who indicated medications to other people presented, statistically, higher prevalence of the outcome (p<0.05).

Participants mentioned the use of 130 different medications, consumed on 832 different occasions (04 participants consumed up to six medications). Medicines were purchased mainly from pharmacies (89.9%; n=545), from family members (5.0%; n=30), neighbor/friend (2.6%; n=16), at the hospital (0.8%; n=5), in basic health units (0.5%; n=3), with the community health agent (0.2%; n=1), and others (1.0 %; n=6) (data not shown in table). Among the 387 students who reported self-medication in the last 30 days, the most consumed drugs, according to the second level of the CTA classification, were analgesics (51.8%), followed by anti-inflammatory and anti-rheumatic (10.4%), antihistamines for systemic use (10.2%) and antibacterial for systemic use (6.3%) (Figure 1).

Regarding the health reasons that led students to practice self-medication, pain problems (54.3%), respiratory tract diseases (15.5%) and genitourinary tract diseases (9.9%) stood out. (data not shown in table). Table 2 presents the results of the multivariate analysis, indicating that the variables "having children" (OR: 1.83; 95% CI: 1.06-3.16) and "having the practice of recommending medication

Table 1. Self-medication practice among university students, according to socioeconomic, demographic, academic and drug behavior variables (n = 483)

Variables	Self-medication		Total n(%)	p-value*
	Yes n(%)	No n(%)		
Gender				
Male	132(82.5)	28(17.5)	160(100.0)	0.357
Female	255(78.9)	68(21.1)	323(100.0)	
Age group				
18 to 20 years old	156(83.0)	32(17.0)	188(100.0)	
21 to 23 years old	129(80.6)	31(19.4)	160(100.0)	0.259
24 or more	102(75.6)	33(24.4)	135(100.0)	
Marital status				
Single	312(82.3)	67(17.7)	379(100.0)	0.128
Not single	75(72.1)	29(27.9)	104(100.0)	
Children				
Yes	63(70.0)	27(30.0)	90(100.0)	0.008
No	324(82.4)	69(17.6)	393(100.0)	
Living with someone				
Yes	341(79.1)	90(20.9)	431(100.0)	0.111
No	46(88.5)	6(11.5)	52(100.0)	
Monthly family income				
Up to 1 Minimum Wage	117(72.2)	45(27.8)	162(100.0)	
Up to 2 Minimum Wage	155(84.7)	28(15.3)	183(100.0)	0.207
Up to 3 Minimum Wage	62(81.6)	14(18.4)	76(100.0)	
Above 4 Minimum Wages	53(85.5)	9(14.5)	62(100.0)	
Course area				
Health	238(80.4)	58(19.6)	296(100.0)	0.846
Other	149(79.7)	38(20.3)	187(100.0)	
Course				
Medicine	22(91.7)	2(8.3)	24(100.0)	
Nursing	98(86.0)	16(14.0)	114(100.0)	
Science: Mathematics and physics	43(81.1)	10(18.9)	53(100.0)	
Biotechnology	38(79.2)	10(20.8)	48(100.0)	0.176
Science: Biology and Chemistry	68(79.1)	18(20.9)	86(100.0)	
Nutrition	65(78.3)	18(21.7)	83(100.0)	
Physiotherapy	53(70.7)	22(29.3)	75(100.0)	
Semester				
Second Semester	110(80.9)	26(19.1)	136(100.0)	
Fourth Semester	104(81.3)	24(18.8)	128(100.0)	
Sixth Semester	71(79.8)	18(20.2)	89(100.0)	0.953
Eighty Semester	71(79.8)	18(20.2)	89(100.0)	
Tenth Semester	31(75.6)	10(24.4)	41(100.0)	
Storage of medicines at home				
Yes	364(80.9)	86(19.1)	450(100.0)	0.120
No	23(69.7)	10(30.3)	33(100.0)	
Reading the medicine instructions				
Yes	276(78.0)	78(22.0)	354(100.0)	0.049
No	111(86.0)	18(14.0)	129(100.0)	
Thinking medications cause health risks				
Yes	278(80.6)	67(19.4)	345(100.0)	0.692
No	109(79.0)	29(21.0)	138(100.0)	
Indicating medications to other people				
Yes	206(87.3)	30(12.7)	236(100.0)	0.001
No	181(73.3)	66(26.7)	247(100.0)	

*p-value - p values according to Pearson's chi-square test
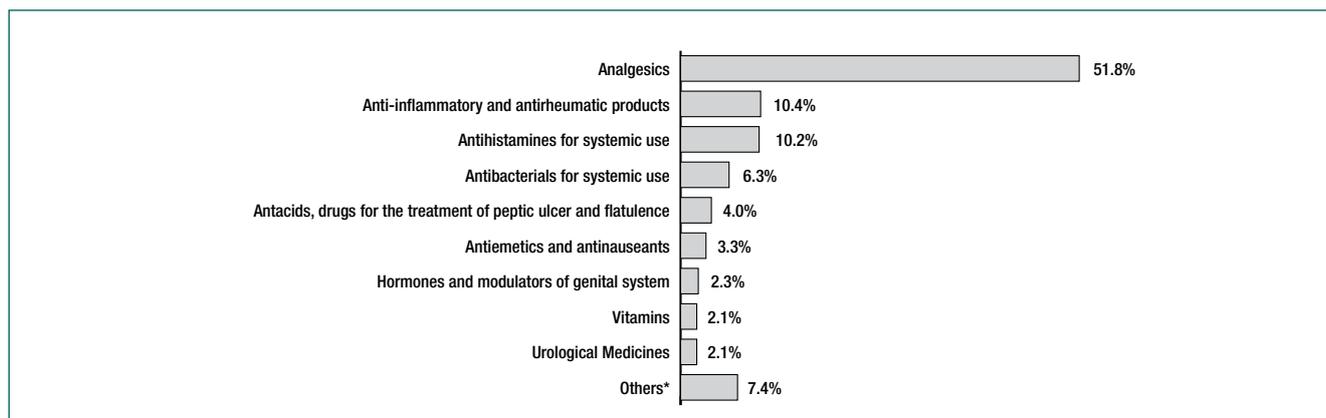
Others* - antidiarrheals, anti-inflammatory agents and intestinal anti-infectives; antiprotazoans; antispasmodic, anticholinergic and propulsive agents; anthelmintics; stomatological preparations; anti-anemic preparations; antifungals for dermatological use; preparations for nasal use; ophthalmological and otological products

Figure 1. Main drugs consumed by self-medication according to therapeutic subgroup, according to Chemical Therapeutic Anatomical Classification (CTA) - level 2

to other people" (OR: 2.38; 95% CI: 1.47-3.86) remained associated with self-medication regardless of other factors (Table 2).

Table 2. Odds Ratio estimated by multivariate logistic regression for variables associated with self-medication among undergraduate students (n = 387)

Variables	Adjusted OR* (95% CI)*	p-value
Children		0.029
Yes	1	
No	1.83 (1.06-3.16)	
Indicating medications to other people		0.001
Yes	2.38 (1.47-3.86)	
No	1	
Reading the medicine instructions		0.147
Yes	1	
No	1.53 (0.86-2.72)	
Storage of medicines at home		0.161
Yes	1.78 (0.80-4.00)	
No	1	
Living with someone		0.175
Yes	1	
No	1.86 (0.76-4.57)	

* Hosmer and Lemeshow Test – 0.41; OR - Odds Ratio; 95% CI - 95% confidence interval

Discussion

This study has as a limitation the use of non-probabilistic sampling since it considered only 70% of enrolled students. Even if this type of sampling approach was chosen, the inclusion of students from different areas was provided, respecting the proportionality of each course. Another point refers to self-report, which could lead to underreporting. However, it is suggested that this item has not influ-

enced the results of the sample, considering that the reports were high and similar to the results of other studies in different regions and locations.

The study advances towards providing more information about the practice of self-medication among university students, investigating factors that are associated with such behavior. Furthermore, it considers a remote region, from the countryside, little explored in epidemiological surveys, elucidating part of the reality of how the group behaves. Analyzing the irrational use of medicines is important, as it allows this issue to be considered in the training of nurses, with a need for qualification on solid and directed bases to understand that this may be a demand for services, requiring action to minimize risks and awareness of the population. It is also noteworthy that the investigation directs health services to consider the university population as a group that presents behaviors that can cause risks to individual and collective health – when they recommend medication to other people.

The prevalence of self-medication among the investigated undergraduate students was high (80.1%), corroborating the findings of other studies.[14,15,17-20] In addition, it is noteworthy that all courses had percentages of self-medication greater than 70.0%.

It is noteworthy that the high rate of self-medication among the group may be probably related to the ease of purchase and access to medicines in pharmacies in the city of Coari, added to the diffi-

culties in using health services faced by the population in the region.[20] In addition, intense academic activities such as tests, papers, internships, extension actions, scientific initiation and other commitments, can act as influencers for self-medication.[16]

Among the courses, it was observed that the consumption of over-the-counter medications is prevalent among undergraduate students, regardless of their area of knowledge. However, it is pointed out that the high prevalence of self-medication among medical students was similar to that found in research carried out in Espirito Santo (71.42% - 3rd and 4th year of the course),[25] Sao Paulo (96,56%).[26] The presence of this behavior among medical students may be related to self-confidence with the knowledge acquired during the course, requiring efforts to monitor these students so that this practice is discouraged.[25]

The practice of self-medication among students of the Nursing course revealed in this study was 86.0%, being the course with the second highest prevalence. In comparison with the results of the investigation carried out in 2014 at the ISB/UFAM (76.0%), only with this audience,[20] it was observed that there was an increase in this conduct. This indicates and reinforces the need for institutional actions in universities, which promote the use and rational indication of medicines, as they are future health professionals who will be at the forefront of health care in the Amazon context, including from traditional groups where the problem of self-medication has already been evidenced,[27] it is necessary that they are aware of the risks, avoiding adherence and encouragement of this conduct.

There was a higher percentage of students who practiced self-medication in the initial semesters of the courses, which may indicate the presence of this behavior before entering university, driven by the cultural heritage of self-medication transmitted from parents to children, also carried out in the countryside of the state. Furthermore, at the beginning of the course, students are faced with a reality different from high school, a moment of adaptation that exposes them to stressors such as academic overload[28] which can make it difficult to manage schedules to seek health services.

Regarding the class of drugs, the findings of the study were similar to those found by researchers in Manaus (70.0% and 78.3%),[19] Santa Catarina (87.7%)[15] and Piaui (95.71%),[18] with analgesics leading the list of those consumed by self-medication. The high use of this therapeutic class by undergraduate students in Coari may be related to the fact that these drugs do not need prescription, they have low cost and palliative action when used for pain relief,[19,20] which makes analgesics preferred for people who have little time to see a doctor, causing them to seek care or consultation only when the signs and symptoms worsen.[16]

In general, pain was the main triggering factor for university students to practice self-medication, corroborating other studies.[15,17-20] This finding suggests that the habit of self-medication among the investigated participants may occur due to the need of students to relieve pain, which may contribute to the hiding of other diseases.

The practice of self-medication with antibiotics was mentioned by 6.3% of the students. In Brazil, although the National Health Surveillance Agency (ANVISA) determines the sale of this therapeutic class only under medical prescription, it was observed that some students managed to acquire and consume these medications without a prescription, showing that irregular sales may be occurring in the city, perhaps because of the lack of supervision by government agencies, allowing the practice to be common in the countryside of Amazonas. It should be noted that self-medication, in addition to the risks of intoxication, can contribute to bacterial resistance in the population of the city.[20,29]

It is noteworthy that most medicines (89.9%; n=545) were purchased at pharmacies, showing the ease of access to medicines, a result similar to other epidemiological surveys in the city with riverside populations in the region also found this result.[20,30]

The study indicated that having children is a variable that increases the prevalence and chance of self-medication. Although issues related to self-medication in the family have not been investigated, it is suggestive that parents maintain a therapeutic itinerary in their homes for emergencies with their children, increasing the stock of medicines (80.0%

of students stocked medicines at home), with left-overs of previous recipes. In addition, as parents are generally responsible for their children's therapy, it is possible that this may confer some security for the practice of self-medication.[31] Therefore, it calls for special attention to students who are fathers and mothers, as this condition can aggravate behaviors of risk. Support groups for these students need to be created by universities in order to guide the importance of rational use of these products.

Another variable that remained associated with self-medication in the multivariate analysis was the practice of indicating medication to other people, showing that the behavior of self-medication among students goes beyond the habit and individual risk, as it can cause a risk to other people, evidencing a conduct irrational. This finding reinforces the need for actions by the university to promote the rational use of medicines by its students, in addition to problematizing the need for actions to control and inspect the sale and distribution of medicines in the city.

Conclusion

Self-medication among investigated university students, in the 30 days prior to the study, was high, especially among students of Medicine and Nursing courses, with analgesics as the most consumed therapeutic class without prescription and pain problems the main reasons for such practice. The characteristic of having children stands out as a factor that increased the prevalence of the outcome. Thus, in addition to considering that undergraduates experience transition situations at university that can influence the adoption of health risk behaviors, special attention should be paid to students who have children. Teaching strategies that strengthen students' awareness should be intensified by universities, aiming to protect them from possible harm arising from self-medication and from the practice of recommending the use of medication to other people, in order to promote individual and collective health. Finally, actions to control the sale of medicines in the city's pharmacies need to be thought of by the managers, in order to curb the purchase of medicines that need prescriptions and control by health agencies.

Collaborations

Lima PAV, Costa RD, Silva MP, Souza Filho ZA, Souza LPS, Fernandes TG and Gama ASM contributed to the project design, data analysis and interpretation, article writing, relevant critical review of the intellectual content and final approval of the version to be published.

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