# Self-medication and Public Health: a study of risk factors and health-related behavior

## Automedicação e Saúde Pública: dimensionamento dos fatores de risco e comportamentos de saúde

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**ABSTRACT**

This study characterized and measured self-medication in adult population, as well as identified possible associations between lifestyle and risk factors for the use of over-the-counter medications. This is an epidemiological, cross-sectional study, carried out in the primary health care of a city in Brazil. The data collection instrument was a semi-structured survey grouped into thematic blocks. The statistical analysis included a bivariate analysis and a binomial logistic regression provided the statistics. Of the 537 participants, 42.83% reported having used medication without a prescription in the last 15 days. There were associations between the dependent variable and migraine (OR = 3.347); current pain (OR = 2.189); use of medications under the influence of family members (OR = 2.431); not reading drugs' leaflet (OR = 1.682); and lack of leisure activities (OR = 4.335). A significant part of users of primary health care self-medicated.

**Keywords**: Self Medication; Drug Utilization; Nonprescription Drugs.

**RESUMO**

O objetivo deste estudo foi caracterizar a prática da automedicação na população adulta, bem como, investigar os fatores de risco e os comportamentos individuais de saúde.Trata-se de um estudo epidemiológico,transversal, realizado na atenção primária em saúde no Brasil. Como instrumento da coleta foi utilizado um inquérito semiestruturado e dimensionado em blocos temáticos. Para estatística foram empregadas a análise bivariada e regressão logística binomial. Dos 537 entrevistados, 42,83% relataram ter feito uso de medicamentos sem prescrição no período de 15 dias. Verificaram-se associações entre a variável dependente e enxaqueca (OR=3,347); presença de dor atualmente (OR=2,189); uso do medicamento sob influência de familiares (OR=2,431); falta de leitura da bula (OR=1,682) e ausência de atividades de lazer (OR=4,335). Conclui-se que mais da metade dos usuários da atenção primária à saúde no Brasil, fez uso de medicamentos sem a prescrição.

**Palavras-chave**: Automedicação; Uso de Medicamentos; Medicamentos sem Prescrição.

## INTRODUCTION

Self-care includes individual actions to maintain health conditions and manage self-diagnosed diseases. This paradigm consists of using non-prescribed drugs to relieve painful symptoms.[1]

Medications can effectively treat several disorders and preserve and restore health conditions.[2] However, the excessive use of such substances can damage health due to drug interactions, adverse effects, and development of resistant strains originating from incorrect diagnosis and delay in seeking health care services.[3,4,5]

Self-medication has increasingly prevailed in many countries and has become a public health problem worldwide.[6,7] The World Health Organization (WHO) defines this practice as the use of drugs to treat self-diagnosed disorders or symptoms.[8]

According to health organizations, more than half of the medications are prescribed, dispensed and sold inappropriately, and misused by individuals.[3] About 80% of drugs are bought without a prescription in developing countries, ratifying an informal medicalization rate between 12.7% to 95%.[9] The lack of knowledge concerning this practice may increase the morbidity and mortality rates, considering that 67% of health problems result from inappropriate use of drugs.[10,11]

Individuals who self-medicate also lack awareness about pharmacotherapeutic information.[12] Drug leaflets are the main informative tool provided to patients upon purchase. Its mandatory presence in the package is regulated by the Ordinance 110/97 of the Brazilian Health Surveillance Department.[14] Leaflets provide patients with explanations about the therapy and helps them rationally use the drug, as prescribed by the National Drug Policy (Ordinance 3916/98).[15]

Self-medication has several inherent risks and consequences for the individual and collective well-being.[7] In Brazil, about one-third of hospitalizations are related to the easy access and incorrect use of medications, which increases government spending.[4,12,13]

This study characterized self-medication in the adult population and investigated risk factors and individual health behaviors associated with the use of non-prescribed medication.

## METHODOLOGY

This exploratory, cross-sectional, quantitative study was performed from January to November 2019. The sample universe comprised adult users of the Brazilian Unified Health System (SUS) who demanded medical and/or dental care in 19 primary health care units (APS) in Araçatuba, a medium-sized city in the state of São Paulo, Brazil. We

recruited participants at the health care units and asked them to answer a semi-structured survey exclusively developed for our study. An interviewer applied the questionnaire. The survey was tested previously and organized in thematic blocks:

Social, educational and medical variables: sex (male or female), aged group, marital status, household income, educational level, some disease (hypertension, diabetes, allergy, migraine, others), any pain or toothache (yes or no); self-medication: have you used medication on your own in the last 15 days (yes or no), store drugs in your house (yes or no), take any medication to someone influence (yes or no), have you ever recommended or given medication for someone (yes or no), did you spend medicine last month (yes or no); knowledge: (Do you know what self medication means (yes or no), medical or dental prescription is important (yes or no) and why (correct or incorrect answer), do you know difference between antibiotics/ anti-inflammatory drugs(yes or no) and what the difference( correct or incorrect answer), do you read drug leaflets (yes or no), what happens take antibiotics unnecessary (correct or incorrect answer), have any risk taking a wrong or unnecessary medication (yes or no); and health behaviors: do you exercise everyday ( never, three times week, more three times), do you smoke (yes or no), do you eat health (rarely, often or always), drink alcoholic beverages ( never, sometimes or always), satisfied with your health, sleep and access healthcare (yes or no), do you participate in any leisure activity( never, sometimes or always), do you consider yourself a stressed person(yes or no).

The inclusion criteria comprised adult participants in the age group from 18 to 70 years, with records of chronic diseases, assisted in the health care units, with cognitive ability to answer the survey, and agreed to participate in the study.

We consulted the Primary Health Care Information System (SIAB) database of the SUS Department of Informatics (DataSUS) and found 197.016 adult and elderly users registered in the health care units located in the municipality of study. We used Epi Info 7.0.2 (Centers for Disease Control and Prevention, Atlanta, USA) to calculate the sample, considering that 50% of the adult and elderly users self-medicated, as verified in the literature. [3,7,12,13,17,32,32,34] Due to potential losses, we added 20% to the sample size, totaling 461 participants.

To investigate the factors that induce self-medication and its associated factors, we performed the Chi-Square test, Fisher's exact test, and the Likelihood Ratio. We isolatedly analyzed the association of the independent variables that presented p-value <0.050 in the bivariate analysis with the dependent variable (self-medication in the last 15 days). After

identifying these associations, we performed a binomial logistic regression with estimates of crude and adjusted Odds Ratio (OR), using the ENTER method. In the data analysis, we used the Statistical Package for the Social Sciences (version 22.0, Chicago, IL). The categorical variables were represented by relative and percentage frequencies, with 95% confidence intervals.

The study was approved by the Research Ethics Committee (CAAE: 02372318.6.0000.5420) and complied with the ethical regulations of the resolution 466/12 of the National Health Council, which follows the Declaration of Helsinki. All participants signed two copies of the consent form before answering the survey.

## RESULTS

The study sample comprised 537 users of the Brazilian Unified Health System (SUS). Most of them were female (84.36%), married (52.15%), aged between 36 and 59 years (46%), and had complete high school (42.84%). We found a statistically significant association between the practice of self-medication in the last 15 days with income, pain (except toothache), and toothache (Table 1).

Table 2 shows a statistically significant association between the use of medication in the last 15 days and the following variables: monthly spending on medication (p=0.000); influence on medication use (p=0.011); recommendation of medication for acquaintances (p=0.000), and self-medication (throughout life) due to toothache (p=0.010).

**Table 1.** Frequency distribution and bivariate analysis of social, educational and medical factors in relation to the dependent variable (self-medication in the last 15 days) São Paulo, Brazil, 2020

| Variables | No | | Yes | | Total | | p-value |
|---|---|---|---|---|---|---|---|
| | **n** | **%** | **n** | **%** | **n** | **%** | |
| **Sex** | | | | | | | |
| Male | 38 | 13.7 | 46 | 17.7 | 84 | 15.64 | 0.205* |
| Female | 239 | 86.3 | 2$^{14}$ | 82.3 | 453 | 84.36 | |
| **Age group** | | | | | | | |
| 18 to 35 years | 117 | 42.2 | 107 | 41.2 | 224 | 41.71 | |
| 36 to 59 years | 121 | 43.7 | 126 | 48.5 | 247 | 46.00 | 0.334* |
| 60 years or older | 39 | 14.1 | 27 | 10.4 | 66 | 12.29 | |
| **Marital Status** | | | | | | | |
| Single | 62 | 22.4 | 63 | 24.2 | 125 | 23.28 | |
| Married | 148 | 53.4 | 132 | 50.8 | 280 | 52.15 | |
| Widowed | 9 | 3.2 | 7 | 2.7 | 16 | 2.98 | 0.942* |
| Divorced | 26 | 9.4 | 28 | 10.8 | 54 | 10.05 | |
| Cohabiting | 32 | 11.6 | 30 | 11.5 | 62 | 11.54 | |
| **Education Level** | | | | | | | |
| Illiterate/Incomplete elementary education | 33 | 11.9 | 32 | 12.3 | 65 | 12.10 | |
| Complete elementary education | 9 | 3.2 | 16 | 6.2 | 25 | 4.65 | |
| Incomplete high school | 54 | 19.5 | 43 | 16.5 | 97 | 18.06 | 0.628* |
| Complete high school | 119 | 43.0 | 111 | 42.7 | 230 | 42.84 | |
| Incomplete higher education | 28 | 10.1 | 23 | 8.8 | 51 | 9.49 | |
| Complete higher education/graduation | 34 | 12.3 | 35 | 13.5 | 69 | 12.86 | |
| **Household Income** | | | | | | | |
| Less than R$ 1,500.00 | 121 | 43.7 | 100 | 38.5 | 221 | 41.16 | |
| Up to R$ 2,500.00 | 70 | 25.3 | 89 | 34.2 | 159 | 29.60 | **0.037*** |
| Higher than R$ 2,500.00 | 66 | 23.8 | 45 | 17.3 | 111 | 20.67 | |
| He/She does not know | 20 | 7.2 | 26 | 10.0 | 46 | 8.57 | |
| **He/She has some disease** | | | | | | | |
| Hypertension | 66 | 23.8 | 50 | 19.2 | 116 | 34.63 | 0.196* |
| Diabetes | 29 | 10.5 | 26 | 10.0 | 55 | 16.42 | 0.858* |
| Depression | 15 | 5.4 | 17 | 6.5 | 32 | 9.55 | 0.583* |
| Allergy | 13 | 4.7 | 11 | 4.2 | 24 | 7.16 | 0.796* |
| Migraine | 4 | 1.4 | 15 | 5.8 | 19 | 5.67 | **0.007*** |
| Arthritis/Arthrosis | 10 | 3.6 | 8 | 3.1 | 18 | 3.35 | 0.732* |
| Heart disease | 5 | 1.8 | 9 | 3.5 | 14 | 2.61 | 0.229* |
| Asthma | 4 | 1.4 | 3 | 1.2 | 7 | 2.09 | 1.000** |
| Kidney disease | 2 | 0.7 | 2 | 0.8 | 4 | 1.19 | 1.000** |
| Anemia | 1 | 0.4 | 1 | 0.4 | 2 | 0.60 | 1.000** |
| HIV | - | - | 1 | 0.4 | 1 | 0.30 | 0.484** |
| Other | 21 | 7.6 | 22 | 8.5 | 43 | 12.84 | 0.707* |
| **Do you currently have any pain?** | | | | | | | |
| No | 248 | 89.5 | 197 | 75.8 | 445 | 82.87 | **0.000*** |
| Yes | 29 | 10.5 | 63 | 24.2 | 92 | 17.13 | |
| **Do you currently have a toothache?** | | | | | | | |
| No | 249 | 89.9 | 208 | 80.0 | 457 | 85.10 | **0.001*** |
| Yes | 28 | 10.1 | 52 | 20.0 | 80 | 14.90 | |

*Chi-square test ** Fisher's exact test

**Table 2.** Frequency distribution and bivariate analysis of risk factors for self-medication in relation to the dependent variable (self-medication in the last 15 days) São Paulo, Brazil, 2020

| Variables | Self-medication in the last 15 days | | | | | | p-value |
|---|---|---|---|---|---|---|---|
| | No | | Yes | | Total | | |
| | n | % | n | % | n | % | |
| **Have you ever taken (throughout life) any medication for toothache?** | | | | | | | **0.010*** |
| No | 125 | 45.1 | 89 | 34.2 | 214 | 39.85 | |
| Yes | 152 | 54.9 | 171 | 65.8 | 323 | 60.15 | |
| **If so, which medication?** | | | | | | | |
| Painkiller | 92 | 60.5 | 92 | 53.8 | 184 | 47.92 | 0.223* |
| Anti-inflammatory drugs | 47 | 30.9 | 59 | 34.5 | 106 | 27.60 | 0.494* |
| Antibiotics | 39 | 25.7 | 41 | 24.0 | 80 | 20.83 | 0.727* |
| Other | 2 | 1.3 | 12 | 7.0 | 14 | 3.65 | **0.012*** |
| **Do you store drugs In your house?** | | | | | | | |
| No | 47 | 17 | 39 | 15 | 86 | 16,01 | 0.534* |
| Yes | 230 | 83 | 221 | 85 | 451 | 83.99 | |
| **Have you ever taken any medication due to someone's influence / recommendation?** | | | | | | | **0.011*** |
| No | 157 | 56.7 | 119 | 45.8 | 276 | 51.40 | |
| Yes | 120 | 43.3 | 141 | 54.2 | 261 | 48.60 | |
| **Who influenced you?** | | | | | | | |
| Friends / Acquaintances | 62 | 51.7 | 76 | 53.9 | 138 | 52.87 | |
| Relatives | 52 | 43.3 | 57 | 40.4 | 109 | 41.76 | 0.563*** |
| A pharmacist | 5 | 4.2 | 8 | 5.7 | 13 | 4.98 | |
| Internet | 1 | 0.8 | - | - | 1 | 0.38 | |
| **Which medication?** | | | | | | | |
| Painkillers | 67 | 55.8 | 72 | 51.1 | 139 | 53.26 | |
| Anti-inflammatory drugs | 27 | 22.5 | 38 | 27.0 | 65 | 24.90 | 0.566* |
| Antibiotics | 5 | 4.2 | 10 | 7.1 | 15 | 5.75 | |
| Other | 21 | 17.5 | 21 | 14.9 | 42 | 16.09 | |
| **Have you ever recommended or given medication to someone?** | | | | | | | **0.000*** |
| No | 211 | 76.2 | 152 | 58.5 | 363 | 67.60 | |
| Yes | 66 | 23.8 | 108 | 41.5 | 174 | 32.40 | |
| **To whom?** | | | | | | | |
| Friends / Acquaintances | 39 | 59.1 | 65 | 60.2 | 104 | 59.77 | 0.605*** |
| Relatives | 27 | 40.9 | 42 | 38.9 | 69 | 39.66 | |
| He/she does not remember | - | - | 1 | 0.9 | 1 | 0.57 | |
| **Which medication?** | | | | | | | |
| Painkillers | 40 | 60.6 | 65 | 60.2 | 105 | 60.34 | |
| Anti-inflammatory drugs | 14 | 21.2 | 17 | 15.7 | 31 | 17.82 | 0.620*** |
| Antibiotics | 4 | 6.1 | 6 | 5.6 | 10 | 5.75 | |
| Other | 8 | 12.1 | 20 | 18.5 | 28 | 16.09 | |
| **Did you spend on medicines last month?** | | | | | | | |
| No | 154 | 55.6 | 104 | 40.0 | 258 | 48.04 | **0.000*** |
| Yes | 123 | 44.4 | 156 | 60.0 | 279 | 51.96 | |

*Chi-square test ** Fisher's exact test *** Likelihood Ratio

Regarding the participants' knowledge about self-medication, 67.41% knew the meaning of the term "self-medication", but 64.25% thought that the inappropriate or unnecessary use of drugs did not cause health problems. Most participants did not read drug leaflets under the premise that they knew the indications and how to use the medication. The dependent variable had a statistically significant association with the reason for self-medication (p=0.023), the risks of using any kind of medication (p=0.047), and reading the leaflets (p=0.27) (Table 3).

**Table 3.** Frequency distribution and bivariate analysis of knowledge about self-medication in relation to the dependent variable (self-medication in the last 15 days) São Paulo, Brazil, 2020

| Variables | Self-medication in the last 15 days | | | | | | p-value |
| --- | --- | --- | --- | --- | --- | --- | --- |
| | No | | Yes | | Total | | |
| | n | % | n | % | n | % | |
| **Do you know what self-medication means?** | | | | | | | |
| No | 99 | 35.7 | 76 | 29.2 | 175 | 32.59 | 0.108* |
| Yes | 178 | 64.3 | 184 | 70.8 | 362 | 67.41 | |
| **What makes some people take drugs without a prescription?** | | | | | | | |
| Personal knowledge | 147 | 53.1 | 127 | 48.8 | 274 | 40.96 | 0.328* |
| Delayed care | 66 | 23.8 | 78 | 30.0 | 144 | 21.52 | 0.107* |
| Relatives | 54 | 19.5 | 32 | 12.3 | 86 | 12.86 | **0.023*** |
| Friends | 41 | 14.8 | 29 | 11.2 | 70 | 10.46 | 0.210* |
| TV and Internet advertising | 33 | 11.9 | 22 | 8.5 | 55 | 8.22 | 0.187* |
| Other | 18 | 6.5 | 22 | 8.5 | 40 | 5.98 | 0.387* |
| **In your opinion, is the medical or dental prescription important?** | | | | | | | 0.849* |
| No | 54 | 19.5 | 49 | 18.8 | 103 | 19.18 | |
| Yes | 223 | 80.5 | 211 | 81.2 | 434 | 80.82 | |
| **Why?** | | | | | | | |
| Incorrect answer | 54 | 19.5 | 49 | 18.8 | 103 | 19.18 | 0.849* |
| Correct answer | 223 | 80.5 | 211 | 81.2 | 434 | 80.82 | |
| **Do you know the difference between antibiotics and anti-inflammatory drugs?** | | | | | | | 0.109* |
| No | 165 | 59.6 | 137 | 52.7 | 302 | 56.24 | |
| Yes | 112 | 40.4 | 123 | 47.3 | 235 | 43.76 | |
| **What is the difference?** | | | | | | | |
| Incorrect answer | 165 | 59.6 | 137 | 52.7 | 302 | 56.24 | 0.109* |
| Correct answer | 112 | 40.4 | 123 | 47.3 | 235 | 43.76 | |
| **Do you know what happens if someone takes antibiotics unnecessarily?** | | | | | | | **0.088*** |
| Incorrect answer | 201 | 72.6 | 171 | 65.8 | 372 | 69.27 | |
| Correct answer | 76 | 27.4 | 89 | 34.2 | 165 | 30.73 | |
| **In your opinion, is there any risk in taking a wrong or unnecessary medication?** | | | | | | | **0.047*** |
| No | 189 | 68.2 | 156 | 60.0 | 345 | 64.25 | |
| Yes | 88 | 31.8 | 104 | 40.0 | 192 | 35.75 | |
| **Do you read drug leaflets?** | | | | | | | |
| No | 186 | 67.1 | 197 | 75.8 | 383 | 71.32 | **0.027*** |
| Yes | 91 | 32.9 | 63 | 24.2 | 154 | 28.68 | |
| **Why?** | | | | | | | |
| To know how to use the medication correctly (indication and contraindication) | 88 | 31.8 | 65 | 25.0 | 153 | 28.49 | **0.082*** |
| He/She trusts the doctor | 189 | 68.2 | 195 | 75.0 | 384 | 71.51 | |

*Chi-square test

Regarding the characterization of health-related behaviors (Table 4), most participants who self-medicated in the last 15 days occasionally engaged in leisure activities (63.87%) and rarely ate healthily (76.54%). In addition, 53.45% of participants were dissatisfied with their health and access to health care services (65.55%). The bivariate analysis showed a statistically significant association between health behaviors and self-medication in the last 15 days: low frequency of physical activity (p=0.004), unhealthy dietary habits (p=0.000), alcohol consumption (p=0.003), lack of leisure activities (p=0.000), stress (p=0.017), sleep disorders (p=0.005), dissatisfaction with one's own health (p=0.000), and dissatisfaction with access to health care services (p = 0.000).

**Table 4.** Frequency distribution and bivariate analysis of individual health-related behaviors in relation to the dependent variable (self-medication in the last 15 days) São Paulo, Brazil, 2020

| Variables | Self-medication in the last 15 days | | | | | | p-value |
| --- | --- | --- | --- | --- | --- | --- | --- |
| | No | | Yes | | Total | | |
| | n | % | n | % | n | % | |
| **Do you exercise every day?** | | | | | | | |
| Never | 54 | 19.5 | 67 | 25.8 | 121 | 22.53 | **0.004*** |
| Up to 3 times a week | 173 | 62.5 | 170 | 65.4 | 343 | 63.87 | |
| More than 3 times a week | 50 | 18.1 | 23 | 8.8 | 73 | 13.59 | |
| **Do you eat healthy?** | | | | | | | |
| Rarely | 191 | 69.0 | 220 | 84.6 | 411 | 76.54 | **0.000*** |
| Often | 79 | 28.5 | 37 | 14.2 | 116 | 21.60 | |
| Always | 7 | 2.5 | 3 | 1.2 | 10 | 1.86 | |
| **Do you smoke?** | | | | | | | |
| No | 261 | 94.2 | 240 | 92.3 | 501 | 93.30 | 0.375* |
| Yes | 16 | 5.8 | 20 | 7.7 | 36 | 6.70 | |
| **Do you drink alcoholic beverages?** | | | | | | | |
| Never | 146 | 52.7 | 102 | 39.2 | 248 | 46.18 | **0.003*** |
| Sometimes | 80 | 28.9 | 84 | 32.3 | 164 | 30.54 | |
| Always | 51 | 18.4 | 74 | 28.5 | 125 | 23.28 | |
| **Do you participate in any leisure activity?** | | | | | | | |
| Never | 39 | 14.1 | 64 | 24.6 | 103 | 19.18 | **0.000*** |
| Sometimes | 211 | 76.2 | 188 | 72.3 | 399 | 74.30 | |
| Always | 27 | 9.7 | 8 | 3.1 | 35 | 6.52 | |
| **Do you consider yourself a stressed person?** | | | | | | | |
| No | 74 | 26.7 | 47 | 18.1 | 121 | 22.53 | **0.017*** |
| Yes | 203 | 73.3 | 213 | 81.9 | 416 | 77.47 | |
| **Are you satisfied with your health?** | | | | | | | |
| No | 127 | 45.8 | 160 | 61.5 | 287 | 53.45 | **0.000*** |
| Yes | 150 | 54.2 | 100 | 38.5 | 250 | 46.55 | |
| **Are you satisfied with your sleep?** | | | | | | | |
| No | 134 | 48.4 | 157 | 60.4 | 291 | 54.19 | **0.005*** |
| Yes | 143 | 51.6 | 103 | 39.6 | 246 | 45.81 | |
| **Are you satisfied with your access to healthcare?** | | | | | | | |
| No | 176 | 63.5 | 176 | 67.7 | 352 | 65.55 | 0.311* |
| Yes | 101 | 36.5 | 84 | 32.3 | 185 | 34.45 | |

*Chi-square test *** Likelihood Ratio

Table 5 shows that participants who presented painful symptoms were 2.189 times (OR=2.18; [95%CI 1.25-3.88]) more likely to self-medicate. Migraine was the main responsible for increasing the use of non-prescribed medications (OR=3.34; [95%CI 1.01-11.07]). Likewise, the participants who had already given and/or recommended drugs to acquaintances and those who bought drugs in the month prior to the survey were more likely to self-medicate, respectively 1.965 (OR=1.96; [95%CI 1.24-3.09]) and 1.532 (OR=1.53; [95%CI 1.03-2.27]). The participants who were influenced by relatives are 2.431 times more likely to self-medicate (OR=2.43; [95%CI 1.40-4.21]). Participants who did not read drug leaflets were 1.682 times (OR=1.68; [95%CI 1.07-2.62]) more vulnerable to self-medicate in the last 15 days.

Table 5 shows that the lack of leisure activities led to the use of non-prescribed medication in the last 15 days, resulting in a 4.335 times (OR=4.33; [95%CI 1.50-12.45]) higher occurrence of medication.

**Table 5.** Crude and adjusted multivariate analysis of the associations between the dependent variable and risk factors for the self-medication. São Paulo, Brazil, 2020

| Variables | Logistic Regression | | | |
|---|---|---|---|---|
| | OR Crude (CI 95%) | p-value | OR Adjusted (CI 95%) | p-value |
| **He/She has some disease: Migraine** | | | | |
| No | - | - | - | - |
| Yes | 4.179 (1.368-12.760) | 0.012 | 3.347 (1.011-11.078) | 0.048 |
| **Do you currently have any pain?** | | | | |
| No | - | - | - | - |
| Yes | 2.735 (1.696-4.411) | 0.00 | 2.189 (1.251-3.882) | 0.006 |
| **What makes some people take drugs without a prescription: Relatives** | | | | |
| No | - | - | - | - |
| Yes | 1.725 (1.073-2.773) | 0.024 | 2.431 (1.402-4.215) | 0.002 |
| **Have you ever recommended or given medication to someone?** | | | | |
| No | - | - | - | - |
| Yes | 2.272 (1.568-3.290) | 0.000 | 1.965 (1.246-3.099) | 0.004 |
| **Did you spend on medicines last month?** | | | | |
| No | - | - | - | - |
| Yes | 1.878 (1.333-2.647) | 0.000 | 1.532 (1.032-2.273) | 0.034 |
| **Do you read drug leaflets?** | | | | |
| No | 1.530 | 0.028 | 1.682 | 0.022 |

| | | | | |
|---|---|---|---|---|
| | (1.048-2.234) | | (1.079-2.624) | |
| Yes | - | - | - | - |
| **Do you participate in any leisure activity?** | | 0.000 | | 0.019 |
| Never | 5.538 (2.289-13.403) | 0.000 | 4.335 (1.509-12.456) | 0.006 |
| Sometimes | 3.007 (1.334-6.781) | 0.008 | 2.450 (0.995-6.035) | 0.051 |
| Always | - | - | - | - |

## DISCUSSION

Over the years, self-medication has reached increasing numbers worldwide. New studies can help manage health services and foster guidelines on the risks inherent to self-medication.

This study showed that 42,83% of the 537 participants who required medical and/or dental care at the Brazilian primary health care units used non-prescribed medications in the 15 days prior to the survey. Previous studies conducted in developing countries found similar results, with a prevalence ranging between 12.7 and 95%.[10,16] Our high prevalence may be associated with the differences in sociodemographic factors and sample size.[5]

The main factors that lead to self-medication are related to social, cultural, economic, and/or health care service issues.[5,17] For example, monthly income and use of medicines had a statistically significant association (p=0.037). This result corroborates other studies and suggests that the health of low-income individuals implies increased use of

drugs, supported by the difficulty to access health care services and pay for medical assistance fees.[3,9]

Participants who presented painful symptoms in the last 15 days were 2.189 times more likely to self-medicate. Pain is the main cause of individuals' incapacity, and the use of drugs is the most suitable treatment due to its high availability and accessibility.[18,19]

The main motivations for the use of non-prescribed medication are headaches and toothaches.[10,20,21,22] We found a statistically significant association between toothache and self-medication. Shafie et al.[9] and AlQahtani et al.[23] reported that 70.7% of their study participants used non-prescribed medication based on the premise that their symptom was not severe compared to other health problems. These participants also lacked knowledge about the adverse effects triggered by the reckless and recurrent use of medications to control toothaches.[9,23] Our results were similar. Participants' previous experience with certain drugs and reduced available time motivated self-

medication.[19,24] The overuse of these drugs may also be related to people's perception of necessity regardless of drugs' health impacts.[25]

Painkillers, followed by anti-inflammatory drugs, were the class of drugs most consumed by participants. The great use of painkillers and anti-inflammatory drugs correlates with their application in the treatment of underdiagnosed conditions, their over-the-counter availability, and their low cost.[25,26] Our data showed that most participants could not differentiate between medication classes (52.70%) and their potential health risks (65.80%). These findings corroborate a study that attributed self-medication with painkillers and anti-inflammatory drugs to gaps in the understanding of the harmful effects of misusing these drugs.[7,27]

In our study, not reading drug leaflets may be an intervening factor in the overuse of non-prescribed medication (OR=1.68 [95%CI 1.07-2.62]). Tesfamariam et al. reported that people rarely read drug leaflets, which may be related to the recurrent use of drugs and reliability in the medical prescriber.[12] Furthermore, patients' varied levels of understanding may affect the quality of the information provided by health professionals and leaflets, which they may even lose after consultation.[7,12,28]

Latin American countries have recently implemented policies to hinder the sales of over-the-counter drugs.[29] The increasing rate of medicalization in Brazil led the government to forbid some classes of drugs, aiming to promote rational use and protect medical prescribers.[30] The easy access to some drugs boost self-medication.[7] In developing countries, the high demand for health services, the flawed pharmacological surveillance systems, and the growing habits of drug consumption contribute to the widespread of medicalization.[7,31]

The drugs used in self-medication are often leftovers stored in the home from previous successful treatments.[2,31, 43] Loyola Filho et al.[32] outlined that the use of such substances by family members is a frequent nuance of self-medication and is related to the number of residents. Likewise, Lei et al[33]. concluded that drugs stored in the home are the result of acquaintances' recommendations, which reveals people's inclination to health-related self-care. In our study, 85% of participants who self-medicated stored drugs at their homes and at least once recommended some kind of medicine to their acquaintances (41.5%).

Participants who self-medicated in the last 15 days had expenses with medication. Oliveira et al.[34] and Bennadi[35] highlighted similar results. People may have increased the purchase of medications using their own resources due to the media influence and the self-diagnosis of health problems, which our

study participants also reported. Aziz et al.[36] observed that participants who considered media a relevant source of information were more likely to self-medicate. The variable "obtaining information about drugs through media" had a low value (8.5%), but it was consistent with studies conducted in European and Asian countries. The pharmaceutical industry advertises in the media to promote the use of medications.[26]

In line with other studies, we observed statistically significant associations between self-medication and participants' individual health behaviors.[3,38] We assessed alcohol consumption, dietary habits, sleep disorders, stress, physical activity, and leisure activity.[37] According to WHO, socialization influences health behaviors, which may cause several diseases that directly affect individuals' physical and mental well-being.[37,38]

Most of the participants who self-medicated were sedentary and rarely had healthy dietary habits. Farhud[39] and Fernandes et al.[40] emphasized that a low frequency of physical activity associated with a poor diet leads to the development of chronic diseases and obesity so that individuals become more vulnerable to self-medication.

The participants who self-medicated also reported dissatisfaction with their quality of sleep and perception of stress. Sleep disorders cause psychosocial impairments, including stress.[39,41] Dutra et al.[42] reported that an ineffective sleep routine triggers unpleasant implications that people often consider irrelevant, which strengthens the clinical signs of stress, such as cephalea, insomnia, and even negative thoughts. Thus, people dissatisfied with their quality of sleep may compromise their mental well-being and resort to self-medication as an adjuvant to restore their health conditions.[39,40,41]

Our adjusted model proved that individuals who did not engage in leisure activities were more likely to use non-prescribed medications in the research period. This finding corroborates Domingues et al[3] study. They reported a tendency of self-medication in people who face adversity in daily errands. Self-medication may be associated with the relief of pain triggered by individuals' routine.

One of the limitations of our study is the lack of a cause and effect relationship due to the application of a transversal methodology. In addition, other limiting factors refer to the large sample universe (convenience sample), which can cause bias due to the selection of the sample in the waiting room and the use of a non-validated questionnaire, which can generate confounding factors. Therefore, it would be necessary to carry out further studies to make the population aware of the potential risks of self-medication, which could improve the quality of life and self-care in health.

## CONCLUSION

This study showed that more than half of the participants have already used non-prescribed medication. Most of them were women with comorbidities. The risk factors associated with self-medication were painful symptoms, use of medications under family members' influence, storage of medications purchased with people's own resources and lack of knowledge about the subject because participants did not read leaflets. The lack of leisure activities was associated with self-medication, so this factor may induce individuals to take non-prescribed medications.

## ACKNOWLEDGEMENTS

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