ORIGINAL ARTICLE

AG-2021-25
doi.org/10.1590/S0004-2803.202100000-61

Prevalence of self-medication for dyspeptic symptoms in primary care: a Brazilian survey

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Received: 15 February 2021
Accepted: 18 March 2021

ABSTRACT – **Background** – Dyspeptic symptoms are among the eight symptoms that most lead to the use of self-medication globally. **Objective** – The aim of the present study was to evaluate the frequency of use and profile of the population doing self-medication to control dyspeptic symptoms in a capital from South Brazil. **Methods** – Application of a survey consisting of topics regarding individual's socio-cultural data, self-reported comorbidities, use of self-medication in the 15 days prior to the interview and information on the use of this medication. Statistical analysis was performed on the data collected to determine the prevalence of self-medication for dyspeptic symptoms (SMDS) and to establish correlations with independent factors, such as gender, age, body mass index (BMI), education, family income and self-reported comorbidities. **Results** – A total of 719 individuals from the public health system were interviewed. Overall, 67.7% were female, 65.3% had a BMI greater than 25; 28.4% presented with self-reported hypertension, 21.4% with depression and 13.8% with diabetes. The prevalence of self-medication to control digestive symptoms in this population was 28.7% (95%CI: 25.3–32), 91.8% (n=189) due to complaints of dyspeptic origin. Proton pump inhibitors were the most used class of medication (67%), followed by antacids (15%). There was a relationship between SMDS and age >38 years (OR=1.734, 95%CI: 1.177–2.580, *P*=0.001), BMI >26 (OR=1.660, 95%CI: 1.166–2.362, *P*<0.001) and self-reported depression (OR=1.471, 95%CI: 0.983–2.201, *P*=0.04). **Conclusion** – There was a higher prevalence of the use of self-medication to control dyspeptic symptoms in relation to previous data from the literature. Age >38 years, BMI >26 and self-reported depression were associated with SMDS.

Keywords – Self-medication; dyspepsia; proton pump inhibitor

INTRODUCTION

Self-care in health refers to an individual's actions to prevent or limit a certain disease and promote and restore health[1]. It is the main resource of public health in the public healthcare system[2], and comprises measures of hygiene, nutrition, lifestyle, environmental factors, social factors, and self-medication[3].

Self-medication consists of the use of drugs without prescription, guidance or follow-up by a medical doctor or dentist[4]. It includes the practice of using leftover medications available at home by the individual or members of the family or social circle, reutilization of old prescriptions and alteration to the posology of medical prescriptions[5]. According to the World Health Organization (WHO), in order for a certain practice to be considered self-medication, the patients must recognize their own symptoms and make intermittent or continued use of the referred agent[2].

Self-medication is well accepted for some clinical conditions, such as chronic pain control, allergies, migraines, skin lesions, fungal infections, flu-related symptoms, heartburn and dyspepsia, among others[6].

In Brazil, the first large study with national scope which faced the challenge of studying specific drugs used as self-medication in detail was the *Pesquisa Nacional sobre Acesso, Utilização e Promoção do Uso Racional de Medicamentos* (PNAUM). This survey was developed by the Brazilian Ministry of Health and showed a prevalence of self-medication of 18.3% in the adult population[5-7]. Thus, it became an important baseline for more research in the area, serving as a parameter for several future studies in different areas of health care[8].

Gastrointestinal symptoms are among the five that most frequently lead to self-medication[9,10]. Drugs aiming control of acid-related gastric disorders are between the third and the sixth class of agents most commonly used for self-medication in several studies in various populations[9,11]. In Spain, 4% of the population reported self-medication for digestive symptoms[12]. In Chile, 7.3% of patients using self-medication were treating digestive disorders, 4.1% using drugs for acid-related problems[13]. In Ethiopia, 6.4% of overall self-medication reported was for dyspeptic symptoms[14]. In the Brazilian population, the PNAUM study[8] showed that in approximately 3.8% of the population from overall self-medication, the reason was for dyspepsia[7].

The aim of this study was to assess the frequency and the profile of the population using self-medication for dyspeptic symptoms in the public healthcare system of a large capital of South Brazil, and therefore provide insights into motivating factors and characteristics which could be related to this type of practice.

METHODS

Data collection

This was a transversal, descriptive and observational study, which consisted of the application of a survey by trained interview-

Declared conflict of interest of all authors: none
Disclosure of funding: none
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ers in person. The questionnaire was based on the data collection instrument used in the national study on practices on the use of medications, PNAUM[8,15]. This instrument consists of a previously validated questionnaire for the Brazilian population regarding several aspects of the use of medications. Among the many areas of interest, it studied self-medication, with a recall period of 15 days, also validated in other studies[16]. From the PNAUM questionnaire, three major question blocks were used (blocks 1, 2 and 4), as well as the sheet of medications of occasional use. We focused our data on aspects of the socio-educational condition of the studied population, associated comorbidities, whether there was self-medication for digestive symptoms, motivating factors for its use, criteria for selection and source of the medication.

Sample selection

Considering the population of 1.933 million inhabitants of the city of Curitiba as the target population, a confidence interval of 95%, and an error margin of 5%, the sample size was initially calculated as 246 cases.

The study was conducted in 37 primary and nine emergency care units of the public health system of the city of Curitiba, Brazil, a large capital from the South of the country (FIGURE 1). Included patients were individuals in waiting rooms of healthcare units at the moment of data collection, who were waiting for consults from medical doctors, dentists, pharmacists or nurses. Individuals who were under 18 years of age, who were dependent of others for intellectual comprehension, or who refused participating in the study were excluded.

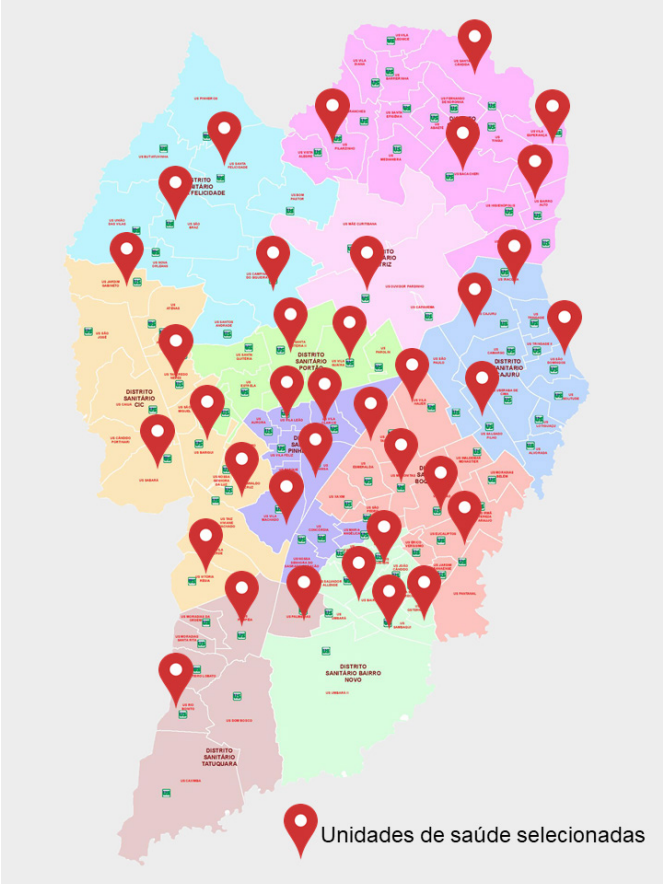

FIGURE 1. Sanitary districts of Curitiba and respective health units included in the study.
Source: adapted by the author from http://ippuc.org.br, 2020.

Statistical analysis

Data analysis was performed with the assistance of the software IBM.SPSS® Statitics v.22.0. (IBM Corporation, New York N.Y., USA). In order to describe the sample, the frequency of events in the studied population was analyzed. The dependent variable of the study was determined as the use of self-medication for digestive symptoms (SMDS), or the absence of such use. The independent variables were age, gender, body mass index (BMI), level of education, family income, marital status, and presence of chronic diseases (comorbidities). They were assessed by reference tables and the chi-square test, considering the dependent variable of the study, SMDS, with the other factors obtained in the survey. For the independent variables of quantitative nature that presented significant difference from the medians obtained according to SMDS, ROC curves were adjusted, and ideal cut-off points for the analysis were determined. For the multivariable analysis, a multiple logistic regression model was adjusted by the method of backward conditional, with the independent variables that were shown to be statistically different in the univariate analysis. Differences with $P<0.05$ were considered to be significant.

Ethical considerations

This study was approved by the Catholic University of Paraná Institutional Review Board (IRB) under reference number 21789819.5.0000.0020 (*Plataforma Brasil* National Ministry of Health's website), and from the local health authorities of the city of Curitiba under reference number 08546919.2.3001.0101.

RESULTS

Patient population

Data was collected from 719 individuals, 66.5% in basic healthcare units and 33.5% in emergency care units. The baseline characteristics, demographic and comorbidity data from included patients are described in detail in TABLE 1. As observed, there was a majority of female patients, aged under 60, without spouse and with a high-school diploma. Hypertension, depressive disorder, dyslipidemia and diabetes mellitus constituted the most commonly self-reported comorbidities.

Self-medication for digestive symptoms (SMDS)

Data analysis showed that 28.7% (n=206, 95%CI 25.3–32.0) of individuals reported self-medicating for symptoms related to digestive problems in the 15 days preceding the interview. From those, 91.2% (189/206) determined that dyspeptic symptoms were the reason for self-medication. The prevalence of self-medication for dyspeptic symptoms was 26.3% (189/719), with 95%CI: 23.1–29.5. When dyspeptic symptoms were classified as reflux, pain or dysmotility, the frequencies found were 60.8% (n=115), 23.3% (n=44) e 15.9% (n=30), respectively.

The medications used by the individuals aiming control of dyspeptic symptoms were grouped into proton pump inhibitors (PPIs), histamine-2 receptor blockers (H2), antacids, pro-kinetics, antispasmodics, and others. PPIs were the most commonly used medications, followed by antacids (FIGURE 2).

TABLE 1. Baseline characteristics of interviewed individuals.

Variable	Description	n	Frequency (%)
Sex	Female	487	67.73
	Male	232	32.27
Age (years)	18–30	193	26.84
	31–45	184	25.59
	46–60	185	25.73
	61–75	138	19.19
	>75	19	2.64
Marital status	With spouse	273	38.08
	Without spouse	444	61.92
Body mass index (kg/m²)	<18.5	5	0.76
	18.5–24.9	222	33.94
	25–29.9	266	40.67
	30–34.9	121	18.50
	35–39.9	34	5.20
	>40	6	0.90
Education level	Never studied	25	3.48
	Primary school	75	10.43
	Middle school	145	20.17
	High school	338	47.01
	College	111	15.44
	Post-graduate	25	3.48
Family income (multiples of monthly minimum national salary)	No income	27	3.96
	Up to 1 salary	119	17.47
	1 to 3 salaries	303	44.49
	4 to 6 salaries	159	23.35
	7 to 9 salaries	41	6.02
	10 to 14 salaries	21	3.08
	>15 salaries	11	1.62
Self-reported comorbidities	Hypertension	204	28.40
	Depression	154	21.40
	Dyslipidemia	122	17.00
	Diabetes	99	13.80
	Rheumatologic diseases	82	11.40
	Chronic pulmonary disorders	68	9.50
	Cardiopathy	56	7.80
	Stroke	8	1.10

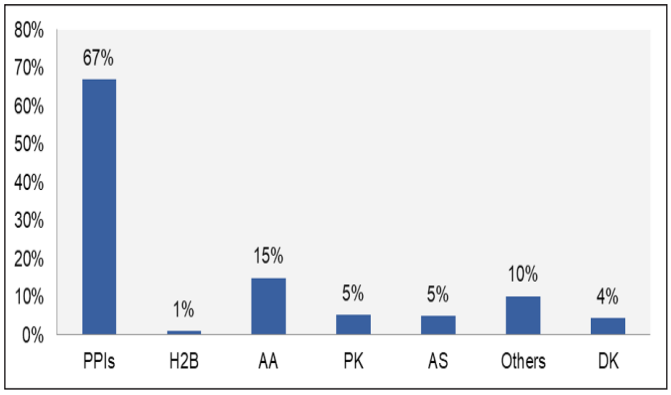

FIGURE 2. Frequency of medication groups used for SMDS.
PPI: proton pump inhibitors; H2B: H2 receptor blockers; AA: antacids; PK: prokinetics; AS: antispasmodics; DK: unknown.

Nearly 20% of included individuals who self-medicated for digestive problems had already done so before. The medication had been previously prescribed by a medical doctor or dentist in 68% of the cases, self-prescribed in 19.4%, suggested by relatives or friends in 8.3%, by a pharmacist in 3.5%, by other health professionals in 0.5%, and by media advertisements in 0.5% of cases.

Regarding the efficacy of the medication, 79.4% answered that the chosen medication was associated to full symptomatic response; 14.1% with partial response; 5.3% with no response; and 1% did not answer. Overall, only 5.3% (11/206) of the individuals reported associated discomfort or drug-related adverse events.

Regarding access to the medications, 91.1% of individuals reported that it was easy to purchase or access the medication. Overall, 45.1% of interviewees obtained the medication through the public health system, 44.5% in retail pharmacies and 6.3% from relatives or friends.

FACTORS ASSOCIATED TO THE USE OF SELF-MEDICATION FOR DIGESTIVE SYMPTOMS (SMDS)

When comparing individuals who did the practice of SMDS with individuals who did not, there was a significant association with age, BMI and the following self-reported comorbidities: hypertension, diabetes, dyslipidemia, rheumatologic diseases and depression. There was not a significant association between SMDS and sex, marital state, level of education, family income or to the following comorbidities: cardiopathy, chronic pulmonary disorders and stroke. These findings are illustrated in detail in TABLE 2.

Individuals with use of SMDS had a lower median age (48±16.44 years) than the group who did not (43±16.87 years), with a cut-off point determined by the ROC curve of 38 years of age (P=0.001). In a similar fashion, the group that used SMDS had higher median BMI (28±4.75 kg/m²) than the group that did not use SMDS (26.8±4.55 kg/m²), with a cut-off point of 26.7 kg/m² determined by the ROC curve (P=0.003). Higher age, higher BMI, and self-reported depression were the independent factors associated to SMDS in multivariate logistic regression analysis (TABLE 3). This analysis shows that for each point increased in BMI, the risk of SMDS increases 4.5%, whereas for each year increased in age, the risk of SMDS increases 1.1%. In the present sample, self-reported depression increases the risk of SMDS by 52% (95%CI 1.02–2.27) by the regression model 1.

TABLE 2. Prevalence of SMDS according to demographic aspects and comorbidities.

Variable	Description	SMDS %	95%CI	*P*
Location of interview	Basic healthcare unit	27.6	23.6–31.6	0.387
	Emergency healthcare unit	30.7	24.9–36.5	
Sex	Female	30.2	26.1–34.3	0.188
	Male	25.4	19.8–31.0	
Age	18 to 30 years old	23.3	17.4–29.3	0.031
	31 to 45 years old	23.9	17.7–30.1	
	46 to 60 years old	34.6	27.7–41.4	
	61 to 75 years old	32.6	24.4–40.4	
	Over 76 years old	42.1	–	
Age (cut-off)	Over 38 years of age	34.4	29.8–38.8	0.0001*
	Under 38 years of age	20.3	15.7–25.0	
Marital state	With spouse	28.6	24.4–32.8	0.841
	Without spouse	29.3	23.9–34.7	
BMI (kg/m²)	Less than 18.5	40.0	–	0.162
	18.6 to 24.9	23.4	17.9–29	
	25 to 29.9	29.7	24.2–35.2	
	30 to 34.9	31.4	23.1–39.7	
	35 to 39.9	44.1	27.4–60.8	
	More than 40	33.3	–	
BMI (kg/m²)	Higher than 26.8	35.1	29.9–40.4	0.0001*
	Lower than 26.8	22.8	18.3–27.3	
Education level (equivalent)	Never studied	32.0	–	0.780
	Primary school	24.0	14.3–33.7	
	Middle school	32.4	24.8–40.0	
	High school	27.2	22.5–32.0	
	College	29.7	21.2–38.2	
	Post-graduate	32.0	–	
Family income	No income	22.2	–	0.917
	Up to 1 salary	30.3	22.0–38.5	
	1 to 3 salaries	29.4	24.2–34.5	
	4 to 6 salaries	26.4	19.6–33.3	
	7 to 9 salaries	26.8	13.3–40.4	
	10 to 14 salaries	33.3	–	
	>15 salaries	18.2	–	
Self-reported comorbidities	Hypertension	37.7	31.1–44.4	0.001*
	Diabetes	37.4	27.8–46.9	0.039*
	Dyslipidemia	39.3	30.7–48.9	0.004*
	Cardiopathy	35.5	23.2–48.3	0.223
	Stroke	50.0	–	0.179
	Chronic pulmonary disorders	36.8	25.3–48.2	0.120
	Rheumatologic diseases	41.5	30.8–52.1	0.006*
	Depression	38.3	30.6–46.0	0.003*

BMI: body mass index; SMDS: self-medication for digestive symptoms. *Variables those were significant at *P* value ≤0.05.

TABLE 3. Multivariate logistic regression analysis for the probability of SMDS.

	Variable	OR	IC 95%	*P*
Model 1	BMI	1.045	1.007–1.085	0.02
	Age	1.011	1.000–1.022	0.05
	Depression	1.523	1.023–2.268	0.04
Model 2	BMI over 26.8	1.660	1.166–2.362	0.00
	Age over 38 years	1.743	1.177–2.580	0.01
	Depression	1.471	0.983–2.201	0.06

BMI: body mass index; SMDS: self-medication for digestive symptoms.

DISCUSSION

The present study has demonstrated a higher prevalence of SMDS (26.3%, 95%CI 23.1–29.5) than most studies previously published over this topic globally. Shehnaz et al.[17], in a systematic review from 2014, described a prevalence of 9.3%[17], and in the large national inquiry on the use of medications PNAUM, the prevalence of SMDS was 6.6%[7]. Differences in methodology between the present study and previous publications may explain these results. Our population was seeking care in the primary care level of the public healthcare system, which may justify early experiences with previously prescribed medications for the control of their symptoms, what can justify the higher prevalence of SMDS. In PNAUM[15], on the other hand, the survey was done in a domiciliary level (patients' homes), including individuals who did not use the public healthcare system. In addition, previous studies assessed self-medication prevalence in general, not directly focused on digestive symptoms. Thus, the present data comprises the first national specific study over the topic of SMDS in primary care.

Given the specific characteristics of primary care in the city of Curitiba, another explanation for the findings of higher prevalence may be the easy access to PPIs. These drugs are freely (at no cost) dispended by the local public healthcare system, which was probably not the case in other locations related to other studies. In addition, this class of medications had a significant cost reduction in the private sector during this period[7]. Approximately 45% of included individuals reported obtaining the medications in public pharmacies against 44% in retail pharmacies, with average price under USD 0.15 per dose, during the period of our study.

Since this survey was conducted with an urban population, in a large city, with better socio-economical and educational conditions than the national average[18], it presents a few peculiar characteristics which might explain the higher prevalence of SMDS. In this scenario, conditions for responsible self-medication are probably met. According to the WHO, individuals' characteristics are fundamental for the practice of responsible self-medication[2]. Individuals must have had the educational opportunity to understand their symptoms, identify their severity, and propose effective measures for their relief, which can be to self-medicate, in milder conditions, or to seek medical attention. The present study showed that over 65% of our included responders have at least 9 years of schooling, having at least a high school diploma, and that more than 37% have a monthly family income higher than USD 750.00. These data once again positions Curitiba among the ten most developed cities in Brazil[18], giving characteristics to the population which can have influenced the results of our survey.

Inadequate eating habits are known to increase dyspeptic symptoms and overweight or obesity are causes of gastroesophageal reflux and dyspepsia, among other digestive issues[19,20]. These conditions may be related to the dada obtained, showing that people with a higher BMI tend to do more self-medication for these specific symptoms.

The literature describes that the practice of self-medication (for any medication) increases with age, especially above 40 years[17,21], similarly to what was found in the present study. Among the many factors which may justify this issue is the reuse of a known specific medication in the population over 40 years of age[5,13]. In PNAUM, Pons et al. showed that 73.8% of individuals reported self-medication based on previous use of the same agent[11]. Just as individuals' characteristics are important for responsible self-medication, the medication in question must have an appropriate profile for this practice[2]. Medications with high efficacy and adequate safety profile, such as PPIs, tend to be reused with greater frequency[22]. In the present study, 85% of interviewees reported that the medication to control digestive symptoms was effective, and less than 6% reported associated adverse events.

Long-term use of PPIs may not be as safe as previously thought[23-25]. An increasing number of studies suggests that this class of medication may be used in the lowest possible dose, for the shortest time necessary and with frequent revisions of the clinical need[26]. Current evidence, though, does not indicate the need to treatment interruption with proper indication to suppression of acid secretion. Special attention must be paid to the possible interactions of PPIs with other drugs[25]. In this context, people who need to use different classes of drugs to treat comorbidities may be more prone to adverse events. In the present study, it was observed that individuals who self-reported hypertension (37.7%, P=0.039), dyslipidemia (39.3%, P=0.004), rheumatologic diseases (41.5%, P=0.006), and depression (38.3%, P=0.003) make more use of SMDS than people who did not report these comorbidities. The association between self-reported depression and SMDS is apparent. According to our analysis, self-reported depression increases the risk of SMDS by 52%. This may be explained by the higher prevalence of dyspeptic symptoms in the population with this comorbidity[27], due to functional dyspepsia and to adverse events associated to psychotropic medications. This topic deserves special attention and requires more detailed studies, so that the implications of this association can be better understood.

The results of this study constitute preliminary data on the subject, and nation-wide studies, with different populations, are warranted to better understand these patient profiles. The population of our study fulfills many criteria for responsible self-medication, and PPIs may be a good option for self-medication in patients with dyspeptic symptoms, as long as they receive proper guidance on usage. There are several other measures that are effective in the control of dyspepsia, such as weight loss, healthy eating habits and the sensible use of medications to treat chronic diseases. However, the high prevalence of the use of PPIs raises attention to the possibility of abusive use. There is a clear need to promote measures of health education and training of health professionals to improve the definition of risks and benefits of this practice in primary care.

The present study is associated with some limitations which must be considered in analyzing the results. The questionnaire had been initially used at the domiciliary level, and there may be a bias in its interpretation since it was applied in a population already included in a healthcare system[28]. In order to minimize this bias, the primary care level was chosen as the target for the study, since it encompasses the whole population of the city. Even then, as it was applied in an urban population, with access to public healthcare, in a large city from South Brazil (a more developed area of the country), it may not represent the reality of other populations of different regions of Brazil and other Latin American countries. Despite these limitations, this is the first study with solid data on SMDS performed in Brazil, which was able to determine associated factors and the profile of this population. The sample has important representativity in the city, since the survey was applied uniformly in all sanitary districts, with a significant sampling of the population corresponding to more than double the previously calculated sample size. The high prevalence in the use of PPIs shows the need for health education measures to be implemented by specialists, aiming increased awareness to the benefits as well as risks in SMDS, which may often lead to a delay in diagnosis and possible adverse events of this class of medication[29,30].

In summary, the prevalence of self-medication for dyspeptic symptoms was higher in the studied population in relation to other studies on the subject (approximately 26%). Individuals over 38 years of age, with a BMI higher than 26.7 kg/m² or with self-reported depression were more likely to self-medicate for dyspepsia. Previous use of the medication with successful control of the symptoms, ease of access, and previous indication by a healthcare professional were the main motivating factors for SMDS. More population-based studies are needed in order to describe rates of self-medication for dyspepsia in different regions of the globe.

ACKNOWLEDGEMENT

We would like to thank Beatriz Gallo Teixeira, Luiza Helena Chemin, Matheus Corvello Teixeira, Raphaela Suzin Marini Munaretto, Sofia Pimentel Longo, Tainá Júlia Tumelero for planning and data collection.

Authors' contribution

Gonzaga CE: data collection. Gonzaga CE, Kotze PG: interpretation and writing of the work. Gonzaga CE, Kotze PG, Olandoski M: conception, planning, analysis, interpretation and writing of the work. All authors approved the final version sent.

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Gonzaga CE, Kotze PG, Olandoski M. Prevalência de automedicação para sintomas dispépticos na atenção primária. Arq Gastroenterol. 2021;58(3):364-9.

RESUMO – **Contexto** – Os sintomas dispépticos estão entre os oito sintomas que mais levam uso de automedicação. **Objetivo** – O presente estudo teve como objetivo avaliar a prevalência e o perfil da população que utiliza automedicação para controle dos sintomas dispépticos em uma capital do Sul do Brasil. **Métodos** – Aplicação de inquérito composto por tópicos relativos aos dados socioculturais do indivíduo, comorbidades autorreferidas, uso de automedicação nos 15 dias anteriores à entrevista e informações sobre o uso deste medicamento. Foi realizada a análise estatística dos dados coletados para determinar a prevalência de automedicação para controle dos sintomas dispépticos e estabelecer correlações com fatores independentes, como sexo, idade, índice de massa corporal (IMC), escolaridade, renda familiar e comorbidades autorrelatadas. **Resultados** – Foram entrevistados 719 indivíduos atendidos pela atenção primária. Destes, 67,7% de indivíduos do sexo feminino, 65,3% apresentavam IMC maior que 25 kg/m², 28,4% autorrelataram apresentar hipertensão arterial sistêmica, 21,4% depressão e 13,8% diabetes. A prevalência de uso de automedicação para controle de sintomas digestivos nesta população foi de 28,7% (n=206, IC95% 25,3–32), 91,8% (n=189) por queixas de origem dispéptica. A classe de medicação mais utilizada foi a dos inibidores de bomba de prótons (67%), seguidos dos antiácidos (15%). Houve relação entre o uso deste tipo de automedicação e idade maior de 38 anos (OR=1,734, IC95% 1,177–2,580, *P*=0,001), IMC acima de 26 kg/m² (OR=1,660, IC95% 1,166–2,362, *P*<0,001) e presença de autorrelato de depressão (OR= 1,471, IC95% 0,983–2,201, *P*=0,04). **Conclusão** – O presente estudo revelou uma alta prevalência do uso de automedicação para controle dos sintomas dispépticos em comparação com dados da literatura, sendo os inibidores de bomba de prótons a classe de droga mais utilizada. Idade maior que 38 anos, índice de massa corporal maior 26 kg/m² e autorrelato de depressão foram associados ao uso de automedicação para sintomas dispépticos.

Palavras-chave – Automedicação; dispepsia; inibidor de bomba de prótons.

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