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ORIGINAL ARTICLE

SELF-MEDICATION AND PUBLIC HEALTH: Analysis of Risk Factors, Knowledge and Health Behaviors in Adults and the Elderly

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Highlights:
(1) Self-medication is prevalent in individuals with a high level of education.
(2) The acquisition of antibiotics without a prescription is still a practice.
(3) Lack of knowledge about drug classes leads to inappropriate use.

ABSTRACT

This study aimed to analyze the health literacy of adults and the elderly regarding self-medication and evaluate the practice and its clinical complications. This is a descriptive, cross-sectional, quantitative study carried out in primary health care in Brazil. A structured instrument comprising 41 questions was used to collect the data. Descriptive statistics and bivariate data analysis were carried out using the Bioestart 5.0 and Epi info 7.2.5.0 software ($p<0.05$). Of the 241 users interviewed, 89% said they take medication independently. When asked about the practice and clinical complications of self-medication, 86% were unaware. In the last 15 days, 83% had taken medication without a prescription from a health professional. The dependent variable (knows what self-medication means and its consequences for health) had a statistically significant association with schooling ($p<0.001$), family income ($p<0.007$), profession ($p<0.001$), place of residence ($p<0.013$), and household stock ($p<0.011$). It was concluded that more than half of the interviewees practiced self-medication and that individuals with a higher level of education, living in urban areas, and holding public office were more likely to self-medicate.

Keywords: Self-medication; Medicines without Prescription; Pharmaceutical Preparations

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INTRODUCTION

During the COVID-19 pandemic, the world suffered many impacts in education, the economy, and health. This global crisis has forced the population to change and adapt to the new needs imposed by the situation. In the area of health, the practice of self-care was highly prevalent, given that the scenario made access to basic health care difficult[1-3].

According to the World Health Organization (WHO), the term self-care is defined as the ability of individuals, families, and communities to promote and maintain their health and prevent and cope with illnesses and disabilities with or without the support of a health professional[4]. Self-care for health conditions is also carried out through prescribed or non-prescribed drugs to treat and relieve the painful symptoms of self-diagnosed illnesses, provided they are used consciously and to a limited extent, and can thus contribute to the patient's general health[4,5].

Self-medication is understood as the self-employed use of medicines, herbs, or home remedies to treat self-identified symptoms. It encompasses the purchase of over-the-counter medicines, prescription-only medicines, or the reuse of stocks of previous prescriptions on the advice of anyone other than health professionals qualified to prescribe[1,2,3,6].

It is known that self-medication is a universal practice, and it is clear that its conscious and limited use is acceptable to solve minor problems, with the advantage of rapid relief of symptoms, as well as saving costs and time for health services, since medicines have a representative share in public budgets. For this practice to be beneficial to the population, they must know about Functional Health Literacy (FHL), which refers to the ability to understand, evaluate, and apply health information needed to make appropriate decisions related to medication, promoting self-care and disease prevention to maintain or improve quality of life[7,8,9].

In this sense, promoting health literacy has become a fundamental role, as it allows us to broaden our knowledge of medication adherence and enables people to make conscious and informed choices about their treatments[10-13].

Self-medication is seen as a global public health problem due to its indiscriminate use without prior knowledge of the medication, which can lead to possible drug interactions, polypharmacy, and the risk of addiction and abuse[1-3].

In addition, other adverse effects can be seen with the practice of self-medication, such as: delay and even a false diagnosis; since there is no evaluation by a specialized professional, masking of diseases; as well as unfavorable responses to the medication, dependence, resistance and even cases of drug intoxication with death records. Thus, in addition to directly affecting the individual, these systemic implications end up affecting the public service, with the imposition of extra costs and overcrowding of medical beds due to the massive and abusive consumption of these drugs[6,13-15].

In this context, the use of medication without a medical or dental prescription is a serious public health problem. Later interventions that have a direct impact on the final result of the treatment corroborate this. Treatment is no longer a simple resolution but is becoming increasingly complex and, in some cases, may not be resolved in the public system[3,16].

In view of the above, the aim of this study was to characterize the practice of self-medication in the adult and elderly population, investigate the risk factors and individual health behaviors associated with the consumption of medicines without a prescription, and analyze users' health knowledge in relation to self-medication.

METHODOLOGY

This is a descriptive, cross-sectional study with a quantitative approach, carried out in the Public Health Service in primary care units in a city in the interior of the state of Bahia, located 623 kilometers from the capital. The Brazilian Institute of Geography and Statistics (IBGE) estimated the population at 13,936 inhabitants in 2022.

To obtain a representative sample, a calculation was made, and the sample universe consisted of 241 users linked to the Basic Health Units (BHU). Users over the age of 18, of both sexes, who were present at the health units during the collection period, March to June 2023, were included. Users with visual and hearing impairments and those who were not linked to the municipality's Basic Health Units were excluded from the study.

A questionnaire structured exclusively for the study, consisting of 41 questions divided into blocks related to sociodemographic conditions, health status, and questions about self-medication, was administered to the interviewees individually in the waiting room of the health units. The users answered the questionnaire, previously tested by the interviewer, face-to-face after reading and agreeing to the Informed Consent Form (ICF).

The dependent variables on the subject of the study were knowledge of self-medication and its complications with the use of drugs without a medical/dental prescription and knowing how to differentiate between the drug classes of anti-inflammatories and antibiotics. As for measuring the practice of self-medication, the variables covered were: using medicines on your own, using and buying antibiotics without a prescription, reading the package leaflet before taking medication, having a stock of medicines at home, and self-medication in the last 15 days. The options for answering these questions, which were read out to the participants, were yes or no. The independent variables included sociodemographic factors, health-related factors, and justifications for using medicines without a prescription.

After collecting the data, it was organized in Microsoft Excel® 2016 spreadsheets, presented in tables, and analyzed using descriptive statistics. The person's chi-square and G-test were then used using Bioestart 5.0 and Epi info 7.2.5.0 software for a bivariate analysis to check for associations between the study's categorical variables. A significance level of 5% was adopted. The bivariate analyses that showed $p<0.05$ were included in the multiple logistic regression model, with estimated Odds Ratio (OR) and 95% confidence intervals.

The Research Ethics Committee approved this study under the number CAAE 67120222.9.0000.5420. It was carried out in accordance with the Declaration of Helsinki and the ethical precepts required by Resolution 466/12 of the National Health Council.

RESULTS

As shown in Table 1, 181 (75%) were female and 60 (25%) were male, aged between 18 and 35 years 126 (52%) and 36 to 69 years 115 (48%), with an average age of 37.15 years ± 12.27. The most common skin color was brown 142 (59%), home ownership 199 (83%), marital status married 139 (58%) and place of residence rural 124 (51%). The highest levels of education were complete secondary education and incomplete primary education, represented by 44% and 31%, respectively. As for their occupation, 80 (33%) of the individuals worked in the salaried sector, while 74 (31%) belonged to the unemployed.

Table 1 – Sociodemographic data of Basic Health Unit users. Bahia, Brazil, 2023

Sociodemographic characteristics		
Sex	n	%
Female	181	75
Male	60	25
Age group		
18 a 27	60	25
28 a 37	70	29
38 a 47	46	19
48 a 59	40	17
60+	25	10
Race		
Yellow	17	7
White	61	25
Indigenous	1	0
Brown	142	59
Black	20	8
Housing		
Own	199	83
Rented	29	12
Financed	2	1
Transferred	11	5
Marital status		
Cohabiting	24	10
Married	139	58
Divorced	7	3
Single	70	29
Widowed	1	0
Profession		
Retired	24	10
Self-employed	50	21
Unemployed	74	31
Student	13	5
Civil Servant	80	33
Education		
Elementary school incomplete	74	31
Complete primary education	34	14
Complete high school	105	44
Complete university degree	28	12

Family income (*Per capita*)		
Up to 500	54	22
Up to 1,500	92	38
Up to 2,500	27	11
More than 2,500	21	9
Doesn't know/wouldn't say	47	20
Place of residence		
Urban	117	49
Rural	124	51
Total	241	100

Source: The authors.

With regard to the health situation of those interviewed, 174 (72%) reported that they were not undergoing dental treatment, while 94 (39%) reported that they had used toothache medication at some point in their lives. When asked about having some kind of illness, hypertension, migraines, and allergies were the most frequently reported: 27%, 21%, and 18%, respectively. Of the 27% who said they were being treated by a specialist, the most common specialties were cardiologist 16 (24%), endocrinologist 11 (17%), and orthopedist 10 (15%).

According to Table 2, the variable dealing with the meaning of knowing what self-medication is and its clinical complications had a statistically significant association ($p<0.05$) with schooling ($p<0.005$), family income ($p<0.0012$), profession ($p<0.001$) and place of residence ($p<0.0131$). It was observed that individuals who had completed high school (62%), were civil servants (50%), and lived in urban areas (58%) were more aware of the term self-medication, as well as the implications that this practice can have.

Table 2 – Frequency distribution and bivariate analysis of sociodemographic data with the dependent variable (self-medication and its clinical complications). Bahia, Brazil, 2023

Variables	Yes		No		p-value
	n	%	n	%	
Education					
Elementary school incomplete	16	21	58	35	
Complete primary education	10	13	24	15	
Complete high school	47	62	58	35	0.005
Complete university degree	3	4	25	15	
Total	76	100	165	100	
Family income (*Per capita*)					
Up to 500	19	17	35	27	
Up to 1,500	44	40	48	36	
Up to 2,500	15	14	12	9	0,0012
More than 2,500	18	17	3	2	
Doesn't know/wouldn't say	13	12	34	26	
Total	109	100	132	100	

Profession					
Retired	1	1	23	17	0.001
Self-employed	22	20	28	21	
Unemployed	29	27	45	34	
Civil Servant	54	50	26	20	
Student	3	3	10	8	
Total	109	100	132	100	
Place of residence					
Urban	63	58	54	41	0.0131
Rural	46	42	78	59	
Total	109	100	132	100	

Source: The authors.

The multiple logistic regression model included the variables schooling, family income, profession, and place of residence. As shown in Table 3, schooling was the variable that remained significantly associated. Individuals who had completed high school (62%) were 2.1628 (OR= 2.1628; CI= 95% 1.47 to 3.19) more likely to consider that they knew the meaning of self-medication and its clinical complications concerning other levels of schooling.

Table 3 – Multivariate logistic regression of the associations between the variable, knowing what self-medication means and its clinical complications, and sociodemographic characteristics. Bahia, Brazil, 2023

Variables	Logistic Regression		
	p-value	Odds ratio	IC 95%
Education			
Elementary school incomplete			
Complete primary education	0.001	2.1628	1.47 to 3.19
Complete high school			
Complete university degree			
Family income (*Per capita*)			
Up to 500			
Up to 1,500	0.904	1.0272	0.66 to 1.59
Up to 2,500			
More than 2,500			
Profession			
Retired			
Self-employed	0.148	1.2882	0.91 to 1.82
Unemployed			
Civil Servant			
Student			
Place of residence			
Urban	0.296	1.4347	0.73 to 2.83
Rural			

Source: The authors.

When asked if they knew the difference between antibiotics and anti-inflammatories, only 67 (28%) said they did. In addition, 123 (51%) of the individuals said they had already taken antibiotics independently, and 107 (44%) had bought them without a medical or dental prescription. This variable, the difference

between antibiotics and anti-inflammatories, was significantly associated with level of education (p<0.004), profession (p<0.001), and place of residence (p<0.021). There was no association between knowing the difference between an antibiotic and an anti-inflammatory and having already taken an antibiotic (p< 0.084).

According to the attitudes related to the practice and knowledge of self-medication, 215 (89%) interviewees said they take medication independently, and 138 (57%) read the package leaflet before taking medication. However, when the interviewees who take medication on their own were asked about the meaning of the term self-medication, 113 (86%) said that they didn't know what it meant. The use of medication on one's own was associated with age (p<0.011), schooling (p<0.008), and place of residence (p<0.003). It was noted that the higher the level of education, the more the practice of self-medication recurred (46%), as well as living in urban areas (51%) and being between 28 and 37 years old (29%).

Although there was no statistically significant association between gender and the use of over--the-counter medication, it is worth highlighting the fact that females are more likely to practice self-medication than males (26%). The study in question found that 74% of women use medication independently.

According to Table 4, the use of medication on one's own was statistically significantly associated with one's knowledge of the medication (p<0.0008), with analgesics 176 (82%) being the most used drug class (p<0.0001). There was also an association between the influence to take medication (p<0.0256) and the practice of recommending medication to someone else (p<0.0001). Respondents who self-medicate do not believe that family members 160 (74%) and pharmacists 167 (78%) have any influence on the practice. In addition, 81% of individuals who said they used medicines on their own claimed to have a stock of drugs at home (p<0.0001).

Table 4 – Frequency distribution and bivariate analysis of the factors that lead to self-medication with the dependent variable (use of medication on their own). Bahia, Brazil, 2023

Variables	Using medicines on their own				p-value
	Yes		No		
	n	%	n	%	
What justifies its use?					
Own knowledge					
Yes	121	56	5	19	
No	94	44	21	81	0.0008
Total	215	100	26	100	
Delayed service					
Yes	69	31	11	42	
No	146	68	15	58	0.4098
Total	215	100	26	100	
Internet/TV advertising					
Yes	51	24	4	15	
No	164	76	22	85	0.4782
Total	215	100	26	100	
Which drug is most commonly used?					
Analgesic					
Yes	176	82	0	0	
No	39	18	26	100	0.0001
Total	215	100	26	100	

Anti-inflammatory					
Yes	104	48	0	0	
No	111	52	26	100	0.001
Total	215	100	26	100	
Antibiotics					
Yes	43	20	0	0	
No	172	80	26	100	0.024
Total	215	100	26	100	
Influence for self-medication					
Family members					
Yes	55	26	1	4	
No	160	74	25	96	0.0256
Total	215	100	26	100	
Pharmacists					
Yes	48	22	0	0	
No	167	78	26	100	0.0150
Total	215	100	26	100	
Did you recommend medication?					
Yes	98	46	1	4	
No	117	54	25	96	0.0001
Total	215	100	26	100	
Is there home stock?					
Yes	175	81	11	42	
No	40	19	15	58	0.0001
Total	215	100	26	100	
Have you taken medication in the last 15 days?					
Yes	126	83	1	1	
No	25	17	89	99	0.0001
Total	151	100	90	100	

Source: The authors.

DISCUSSION

Self-medication is considered to be a public health problem, as there are many risk factors that its unbridled use can cause to health, such as drug resistance and interactions, intoxication, misdiagnosis, and even the masking of serious illnesses. Worldwide, Brazil is one of the main drug-consuming countries, and due to its high prevalence, new studies are pertinent to understanding users' profiles and guiding the management of health services to complement and promote policies on the risks inherent in the practice[17-19].

In this study, verifying the knowledge and attitudes of the 241 users interviewed at the Basic Health Units towards self-medication was possible. The prevalence of using medicines on their own was 89%. These results corroborate the studies by Porto et al.[20] and Amaral et al.[21], which found a 74% and 82% prevalence in the use of medication without a medical/dental prescription. As a result, we can see a growing trend in this practice over the years and how essential it is to raise awareness and

provide information to the population about the complications arising from the indiscriminate use of medication without the guidance and prescription of a health professional.

As for gender, in the study in question, females were the most affected, with around 74% reporting that they used medication independently, in agreement with studies by Ferreira et al.[19] and Pinto et al.[22], who reported a higher prevalence. The results of these studies can be justified by the fact that women have a higher self-care profile than men, seeking more consultations at health units, which explains the high frequency of interviewees in this study, as well as having a more accentuated perception of diseases and consequently a greater predisposition to self-medicate. In addition, physiologically, women are more affected by painful processes, such as episodes of dysmenorrhea[23,24].

Self-medication was also related to the age groups in the study, with the most prevalent users aged between 36 and 69 (51%). This result can be attributed to the health problems affecting individuals, involving acute, self-limiting illnesses common to all ages. In addition to the chronic diseases seen in older people, who consequently use medication without a doctor's/dentist's prescription more often[21,25].

Arruda et al.[26] together with Santos, Andrade, and Bohomol[27] point out that there are various reasons why individuals resort to self-medication, with pain being one of the main reasons and the main objective being to try and get immediate relief. In the study in question, 21% of the interviewees reported having a migraine attack and having used over-the-counter medication to control the condition, which is also justified by the authors cited above, due to the easy accessibility of the products in pharmacies.

Among the drug classes, analgesics are the most commonly used drugs; in the study in question, 82% use them and consider them to be their first choice. Due to the high prevalence of pain in the general population, often triggered by tension, stressful situations, or physical demands, the practice of self-medication with this class of drugs is justified, and an attentive look at the interference in people's quality of life becomes evident[23,28].

Although many people take medicines without a prescription, since they are considered over-the-counter, it is crucial not to underestimate the potential adverse effects and toxicities. Both analgesics and anti-inflammatory drugs, the second most used class of medication in the study, and agreement with other studies, have clinical implications that deserve to be highlighted, such as gastrointestinal disorders, allergic reactions, and renal effects[23,28].

Self-medication is deeply associated with various factors, mainly sociocultural and economic issues and the availability of health services in these individuals[17,29]. It is also induced by underlying factors, with the experience already acquired with the drug previously used being the most preponderant factor.

In this study, it was possible to observe that the above factors directly influence the practice of self-medication. It was noted that individuals with a high level of schooling, who work as employees and consequently have a structured family income and live in urban areas, have more knowledge about self-medication and its implications. As shown by Shafie et al.[5]; Ferreira et al.[19] and Hajj et al.[30], the higher the level of education, family income, and residence in urban centers, the more likely they are to self-medicate due to their confidence in their own knowledge and day-to-day experiences.

However, it is important to ask how harmful the practice of self-medication is, having a high level of education and consequently knowledge and maturity about the implications that such an act can generate in life, such as incorrect self-diagnosis, dangerous drug interactions, masking a serious illness, as well as drug dependence and abuse[5]. Since, on the assumption that the greater one's knowledge of the implications of a given situation, the less likely one is to practice it, it is questionable why those who hold the information are practicing it.

In the survey, it was possible to note a significant disagreement in the answers to the questionnaire. It is worth highlighting that 86% of the individuals who said they used medication on their own also said they did not know the meaning of the term self-medication and its implications. This suggests that knowledge and the attitude of self-medication go in opposite directions.

Another factor that deserves to be highlighted, according to the findings of this study, is not knowing how to differentiate between the drug classes of anti-inflammatories and antibiotics, and yet having a high frequency of using antibiotics on their own (51%), and even obtaining the drug without a medical or dental prescription (44%), since this is considered mandatory for dispensing the drug[18,20]. This finding aligns with the study by Al-Taie, Hussein, and Zahraa[31], in which a high percentage of participants (45.8%) reported using antibiotics without a medical/dental prescription, 35% of which were purchased in pharmacies without a prescription.

Knowledge of a given situation is expected to shape an individual's attitudes. The increase in self-medication with antibiotics is directly associated with a lack of knowledge about the risks of the inappropriate use of this medication, with bacterial resistance being the main risk. Therefore, it is crucial to disseminate information to generate knowledge about the appropriate use of antibiotics and their acquisition only with the prescription and guidance of the health professional[30,31].

As Ferreira et al.[19] and Gama and Secoli[32] pointed out, in small towns, where inspections by the responsible bodies are not carried out in detail and interpersonal relationships are more present, many medicines are dispensed without the need for a prescription, as in the case of antibiotics. This is in line with the study's results, in which around 44% claimed to have bought antibiotics without a medical or dental prescription from pharmacies.

According to recent studies, the main factors driving self-medication are linked to the difficulty of accessing and delaying care in the specialized public health service due to long queues for appointments and, in some cases, in the private service, despite the progress that has been made. In addition to these aspects, the use of old prescriptions, medicines stored at home, beliefs about medicines, and advice from friends, family, and even pharmacy employees all justify the practice of self-medication[20,33-35].

In line with the above context, another aspect that contributes to this practice and is rooted in modern society is the high flow of information from the media. The advertising of drugs, seen in TV commercials and on social networks, has a significant impact on the increase in the number of people who self-medicate due to the search for ways to treat themselves quickly and with a guarantee of improvement in the face of propagandized comments. As Costa Junior, Oliveira, and Amorim[34] point out, self-medication is even more common among individuals with high purchasing power, who resort to immediate solutions for their illnesses not to compromise their daily activities.

Having said this, it can be seen that far beyond a pharmacological habit, self-medication is linked to social habits, evidenced by social behaviors[25,34,35]. Thus, the initiatives that could be adopted to reduce the use of drugs on their own would be to favor greater and easier access to health services while maintaining the benefits of using medicines at lower risk. In addition, restrictions are placed on disseminating information not contained in the package leaflet or without scientific evidence – as well as numerous awareness campaigns in primary health care regarding the risks and rational use of medication[36].

A limitation of this study is its cross-sectional structure, which may lead to causality bias for some variables. Memory and information bias may also be possible because the interviewees were approached using an unvalidated questionnaire in the Basic Health Units' reception room, which may underestimate or overestimate some data.

CONCLUSION

The use of medicines without a doctor's prescription is a common but potentially dangerous practice, which can result in serious clinical complications such as allergic reactions, gastrointestinal disorders, renal effects, resistance to antibiotics, and worsening of pre-existing health conditions. Many resort to self-medication for quick relief of symptoms, without considering side effects or drug interactions, as pointed out in this study. Furthermore, it was concluded that more than half of the interviewees practiced self-medication, and individuals with a higher level of knowledge were more likely to medicate themselves than those with a lower level of education. There was also a high level of self-medication by women and by those who had a stock of drugs at home. It was also possible to observe that more than half of the interviewees were unaware of self-medication and its clinical implications, as well as not knowing how to differentiate between the drug classes of antibiotics and anti-inflammatories. Yet, a significant number of participants were able to buy antibiotics without a medical/dental prescription at pharmacies.

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