

Biomédica 2014;34:580-8
doi: <http://dx.doi.org/10.7705/biomedica.v34i4.2229>

ARTÍCULO ORIGINAL

Social, cultural and economic factors associated with self-medication

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Introduction: Self-medication is an increasingly frequent phenomenon worldwide; some studies suggest that there is a relationship with socio-economic and cultural factors.

Objective: To determine the prevalence of self-medication and its related factors in a Colombian city.

Materials and methods: Cross-sectional descriptive study, in Pereira, Colombia. We selected 414 adults using simple randomization sampling with houses used as the observational unit. The IRIS-AM instrument was used to collect the information required.

Results: Four hundred and fourteen (414) people were interviewed, 62.6% were females, and mean age was 44 years; 77.5% of the sample had self-medicated at least once in their life and 31.9% during the last month. The most commonly used medications were: analgesics and antipyretics (44.3%), non-steroidal anti-inflammatory drugs and anti-rheumatic medication (36.4%), and anti-histamine medication (8.5%). The most commonly self-medicated symptoms were: headache (55.7%), cold (16.2%) and muscular pain (13.2%). Multivariate analysis revealed an association between self-medication throughout life and storing medications at home, and between a high level of education and having a favorable opinion of self-medication. Storing medications at home and recommending them to others were associated with self-medication during the previous 30 days.

Conclusion: Self-medication rates were found to be similar to those reported globally, but there is not an established pattern for this practice. Associations were found between social and demographic variables and self-medication, which require further characterization. Intention to self-medicate has not been well-described in other studies, and may be an important indicator which will contribute to future understanding of this phenomenon.

Key words: Self medication/adverse effects, pharmacoepidemiology, pharmacovigilance, Colombia.

doi: <http://dx.doi.org/10.7705/biomedica.v34i4.2229>

Factores económicos, sociales y culturales asociados con la automedicación

Introducción. La automedicación es un fenómeno cada vez más frecuente a nivel mundial. Los estudios en este campo sugieren que hay una relación entre la automedicación y diversos factores sociodemográficos y económicos.

Objetivo. Determinar la prevalencia de la automedicación y los factores relacionados en Pereira, Colombia.

Materiales y métodos. Estudio descriptivo de corte transversal llevado a cabo en la población de Pereira. Se hizo un muestreo aleatorio por afijación proporcional en 414 adultos, y se desarrolló y aplicó la encuesta IRIS-AM (*Instrument for Systematic Data Collection of Self-Medication*).

Resultados. Se encuestaron 414 personas, 62,6 % de las cuales eran mujeres; el promedio de edad fue de 44 años. La prevalencia de la automedicación fue de 77,5 % a lo largo de la vida y de 31,9 % en los 30 días previos. Los medicamentos más comúnmente utilizados fueron los analgésicos y antipiréticos (44,3 %), los antiinflamatorios no esteroideos (36,4 %), y los antihistamínicos (8,5 %). Los síntomas que llevaron a la automedicación con mayor frecuencia fueron la cefalea (55,7 %), el resfriado (16,2 %) y el dolor muscular (13,2 %). Los análisis multivariados mostraron asociación entre la automedicación

Author's contributions:

Jorge Enrique Machado-Alba, Luis Echeverri-Cataño, Manuel José Londoño-Builes and Paula Andrea Moreno-Gutiérrez contributed to the conception and design of this paper, to the collection of information, the data analysis, the writing of the paper and the approval of the final version.

Sergio Andrés Ochoa-Orozco and Joaquín Octavio Ruiz-Villa contributed to the conception and design of the paper, to the data analysis, the writing of the paper and the approval of the final version.

a lo largo de la vida y guardar medicamentos en casa, así como entre tener un nivel superior de escolaridad y estar a favor de la automedicación. Los factores referentes a almacenar medicamentos y recomendarlos a otros se asociaron con la automedicación en los 30 días previos.

Conclusiones. La prevalencia de la automedicación hallada en este estudio fue similar a la reportada previamente a nivel mundial; aun así, no existe un patrón establecido para esta práctica. Se evidenciaron las variables sociodemográficas asociadas con la automedicación, las cuales requieren una mejor caracterización. La intención de recurrir a la automedicación ha sido poco estudiada y podría ser un indicador importante para la medición y comprensión de este fenómeno.

Palabras clave: automedicación/efectos adversos, farmacoepidemiología, farmacovigilancia, Colombia.
doi: <http://dx.doi.org/10.7705/biomedica.v34i4.2229>

Self-medication is the treatment of common health problems with medication tagged for those indications and safe enough to be used without a medical prescription (1). However, the indiscriminate consumption of drugs is considered a public health problem that entails disadvantages including diminishing clinical effectiveness, an increase in treatment durations and prolongation of recovery. It may even cause renal diseases, peptic ulcers, hepatic pathologies and bacterial resistance to antimicrobial therapy, thereby generating a disease burden and costs to the Colombian health system (SGSSS) (2).

Some international authors have characterized this phenomenon, starting with a description of the prevalence and the factors that could determine this practice. In Colombia, prevalence has been found to vary from 21.8% to 97.0%; the rate varies between countries: Spain (14.0%-90.8%), Brazil (29.4%-86.4%), China (47.8%), United Arab Emirates (49.0%), Niger (53.2%), India (57.0%), Ghana (70.0%) and Iran (76.6%) suggesting that different population characteristics are associated with self-medication (1-16).

Different studies of this topic suggest that there is a relationship between self-medication and social or demographic factors, in addition to a cultural component that must be identified and which varies for each population group (3). These relationships are unknown for Colombian populations. The aim of this research was to determine the prevalence of self-medication and the social, demographic, economic and cultural factors associated with it in the city of Pereira, Colombia, in 2013.

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Recibido: 27/12/13; aceptado: 07/07/14

Materials and methods

Study design and population

A descriptive cross-sectional study was carried out among the population of the city of Pereira, estimated at 464,719 in 2013 according to the Colombian National Administrative Statistics Department (DANE). A representative sample was calculated to give a confidence level of 95.0% with a self-medication prevalence of 80.0% (1-15) and a permissible error of 2.0%.

Sampling

A simple random sampling was carried out with proportional fixation by communes and neighborhoods using blocks as sampling units. Random distribution of the block side on which the survey was started was implemented, taking five houses per block. Observational units were people older than 18 years living in the chosen houses.

Information gathering

Information was gathered by means of the Instrument for Systematic Data Collection of Self-Medication (IRIS-AM), developed and validated by the research team, and surveys were completed with trained health-related personnel. This instrument considers the following variables: 1) Sociodemographic: Age, gender, education level and socioeconomic level; 2) self-medication: Throughout life, during the previous 30 days, symptoms that lead to self-medication, pharmacological group used, source for drug information, site from which the drug was obtained; 3) behavioral procedure on presentation of specified symptoms: Intention to self-medicate, drugs to use, intention to visit the doctor; 4) knowledge about adverse drug reactions, domestic drug-storage conditions, drugs stored at home and whether the person recommends drugs to others or not, and 5) attitude towards self-medication: Investigated with an open question whose responses were later classified as "against", or "in favor", with this latter category further subdivided to create two additional

categories: “bad, but necessary” and “in favor if symptoms are mild and/or recommended drug treatment is well-known”.

Informed consent was obtained from each participant. The study project was approved by the Universidad Tecnológica de Pereira’s Bioethics Committee as “research with no risk” according to Resolution 8430/1993 issued by the Colombian Health Ministry and in accordance with the Helsinki Declaration.

Analysis and data processing

Data were compiled in a Microsoft Office Excel 2010 database, drugs were classified according to the Anatomical Therapeutic Classification (ATC) and the analysis was carried out using IBM SPSS Statistics version 21.0 (SPSS® Inc., Chicago); descriptive statistics, including dispersion measurements, and the χ^2 test were used for categorical variables. Binary logistic regression was carried out for significantly associated variables in the previous analysis, with self-medication behavior as the dependent variable: self-medication throughout life, self-medication in the prior 30 days and intention to self-medicate. A confidence interval of 95.0% and significance level of $p < 0.05$ were used.

Results

Of 414 people surveyed, the majority were female, with a low socioeconomic level, affiliated to the SGSSS, with basic or secondary education and little or no knowledge about drugs (table 1).

Table 1. Characteristics of the survey sample with respect to self-medication, Pereira, Colombia, 2013

Sociodemographic characteristics	%
Sex (male/female)	37.4/62.6
Age (median \pm SD, years)	44 \pm 17.07
Socioeconomic stratum (n=414)	
Low	51.4
Medium	41.1
High	7.5
Health system affiliation (n=409)	
Non-subsidized system	50.4
Subsidized system	43.5
Other	3.9
Don't know	2.2
Education	
None	10.9
Basic	72.7
Higher	16.4
Knowledge of medications (n=411)	
None	41.4
Poor	47.9
Good or very good	10.7

Self-medication throughout life and in the previous 30 days

We found that 321 participants (77.5% of the sample) had self-medicated at least once in their life and 132 (31.9%) on at least one occasion during the 30 days prior to survey administration. Characteristics and variables considered with respect to self-medication in the last 30 days were: drug type, symptoms, reasons for self-medication, source of information about drugs and source of drug (table 2). Self-medication rates by gender and age group are shown in figure 1.

Multivariate analysis showed that self-medicating at least once over the lifespan was significantly associated with having a high level of education (OR=2.5; 95% CI:1.016–6.230, $p=0.046$), storing drugs at home (OR=1.7; 95% CI:1.039–2.807, $p=0.035$) and being in favor of self-medication (OR=4.2; 95% CI:2.060–8.493, $p<0.001$) Absence of self-medication was associated only with being female (OR=0.42; 95% CI:0.234–0.736, $p=0.003$).

Table 2. Characteristics of self-medication during the 30 days prior to the survey, Pereira, Colombia, 2013

Characteristics	%
Number of pharmacological groups (n=176)	1/2/3 69.1/26.3/4.6
Kind of drug (n=176)	
Analgesics/antipyretics	44.3
NSAIDs	36.4
Antihistamines	8.5
Antibiotics	6.3
Symptom (n=172)	
Headache	54.1
Flu	15.7
Muscle pain	12.8
Infection	6.4
Reason for self-medication (n=143)	
Lack of time	28.7
Difficulty in accessing medical consultation formalities	28.0
Sociocultural conditions, traditions and myths	19.6
Previous prescription	6.3
Negative opinion about the care or health system	4.9
Saving money	7.0
Difficult geographical access to health services	2.8
Mild illness	2.8
Source of information (n=138)	
Family	40.1
Previous prescription	33.3
Pharmacy	16.7
The media	8.3
Drug procurement place (n=138)	
Pharmacy	55.1
Medicine cabinet	24.6
Store	15.2
Other people	5.1

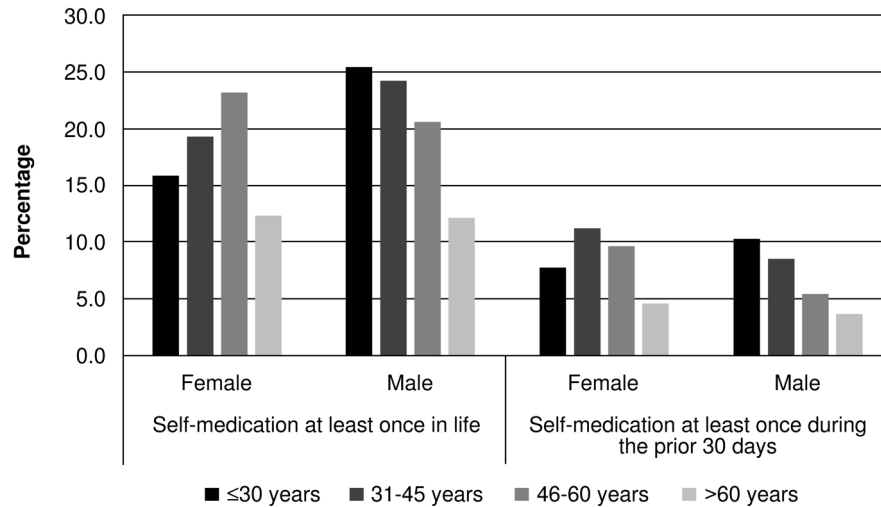


Figure 1. Prevalence of self-medication throughout life and over the previous 30 days by sex and age group in Pereira, Colombia, 2013

On the other hand, having self-medicated in the previous 30 days, was associated with storing drugs at home (OR=1.6; 95% CI:1.023–2.515, p=0.039), recommending drugs to others (OR=1.6; 95% CI:1.014-2.651, p=0.044) and being in favor of self-medication (OR=2.2; 95% CI:1.388–3.414, p=0.001).

When asked about domestic drug storage, 239 people (58.2% of the sample) said they did store drugs at home; 186 of them (77.8%) stored analgesics/antipyretics and 79 (33.5%) stored non-steroidal anti-inflammatory drugs (NSAIDs), 50 (20.9%) stored “drugs prescribed by doctors” (previously formulated following a medical consultation), 21 (8.8%) stored antibiotics and 17 (7.1%) stored drugs for treating ulcer-like symptoms. Additionally, 103 people (25.1%) said they recommended drugs to others.

Participants’ attitude to self-medication was also investigated; 284 people (68.5%) said they were against it and the remainder 130 (31.5%) were in favor of it; similarly, 43 people (10.4%) had a favorable opinion of it for treating a “mild symptom” or when using a “well-known drug” and 31 (7.7%) considered it a “bad but necessary habit”. The relationship between attitude and other variables is shown in table 3; no attitude category was significantly associated with socioeconomic level, affiliation to the SGSSS or knowledge about drugs.

Intention to self-medicate

Of the 11 symptoms investigated in relation to the intention to self-medicate, participants were likely to self-medicate for a mean of three different

symptoms (SD=2.2, range:0-10). Intention to self-medicate for at least one of the symptoms was expressed by 325 people (78.5%) while 46 (11.1%) stated they would self-medicate for more than half the symptoms surveyed. Behavior in relation to each symptom can be seen in figure 2. A total of 164 women answered a question about how they would respond to having menstrual pain.

The five most commonly used pharmacological groups are shown in table 4. The main groups used to treat flu were anti-flu medicines, followed by analgesics; for fever and headache the main groups were analgesics followed by NSAIDs; for diarrhea and abdominal pain it was home remedies; for allergic symptoms people would mostly use antihistamines (n=224, 54.3%), antibiotics were the preferred group for treating infection (n=322, 78.0%), home remedies were the most commonly used treatment for insomnia and NSAIDs for menstrual pain.

Multivariate analysis showed the following variables were associated with intention to self-medicate for at least 1 symptom: Recommending drugs to others (OR=2.25; 95% CI:1.121–4.553, p=0.23), storing drugs at home (OR=1.96; 95% CI:1.187–3.266, p=0.009) and being in favor of self-medication (OR=2.74; 95% CI:1.401–5.368, p=0.003). Being older than 60 years was associated with absence of intention to self-medicate (OR=0.36; 95% CI:0.206–0.632, p<0.001). Intention to self-medicate for more than 50% of the symptoms surveyed was associated with a high level of education (OR=2.59; 95% CI:1.293–5.215, p=0.007), recommending

Table 3. Relationship between the attitude towards self-medication and the sociodemographic variables in a sample from Pereira, Colombia, 2013

Sociodemographic variables	Against		In favor		p value	OR*	95% CI	Symptoms are mild and/or recommended drug treatment is well-known		p value	OR	95% CI
	n	%	n	%				n	%			
Sex												
Male	96	61.9	59	38.1				20	12.9			
Female	186	72.1	72	27.9	0.032	0.630	0.413-0.962	23	8.9	0.199	0.661	0.350-1.247
Age (years)												
< 30	61	59.2	42	40.8	0.022	1.713	1.077-2.726	19	18.4	0.002	2.793	1.451-5.375
31-45	69	61.6	43	38.4	0.075			12	10.7	0.847		
46-60	85	73.3	31	26.7	0.173			10	8.6	0.496		
>60	65	82.3	14	17.7	0.003	0.399	0.215-0.742	1	1.3	0.003	0.091	0.012-0.670
Socioeconomic stratum												
Low	141	66.2	72	33.8	0.348			27	12.7	0.120		
Medium	122	72.2	47	27.8	0.155			14	8.2	0.239		
High	19	61.3	12	38.7	0.385			2	6.5	0.453		
Health system (n=409)												
Non-subsidized system	141	68.8	64	31.2	0.779			26	12.6	0.111		
Subsidized system	117	65.7	61	34.3	0.359			16	9.0	0.445		
Other	20	80.0	5	20.0	0.189			0	0.0	0.080		
Education												
None	32	74.4	11	25.6	0.350			0	0.0	0.019	0.885	0.853-0.918
Basic	207	68.8	94	31.2	0.726			30	10.0	0.627		
Higher	42	61.8	26	38.2	0.206			13	19.1	0.010	2.482	1.219-5.053
Knowledge of medications												
None	112	66.3	57	33.7	0.462			18	10.6	0.928		
Poor	143	72.6	54	27.4	0.072			20	10.2	0.831		
Good or very good	25	56.8	19	43.2	0.083			5	11.4	0.841		
Recommending drugs to others												
Yes	60	58.8	42	41.2				16	15.5			
No	220	71.7	87	28.3	0.016	1.770	1.111-2.821	26	8.5	0.037	2.011	1.031-3.921
Storing drugs at home												
Yes	148	62.2	90	37.8				25	10.5			
No	133	77.3	39	22.7	0.001	2.074	1.332-3.229	18	10.5	0.990		

* Variable was taken as indicating risk for self-medication

drugs to others (OR=2.09; 95% CI:1.088–3.643, p=0.027) and being in favor of self-medication (OR=1.92; 95% CI:1.016–3.643, p=0.045).

Discussion

It was possible to identify the prevalence of self-medication in the population studied and the variables associated with its practice. Self-medication is very common in this Colombian population according to this study, which revealed that at least three quarters of the people have self-medicated at least once in their life and one third during the month prior to the survey. These results are similar to those reported in Colombia (77.5% vs. 21.8-97.0%) (12-14) and globally (77.5% vs. 14.0-90.8%) (1-11,15).

There are few studies that have looked at a whole city, and the numbers reported by local and international

studies show a wide variability influenced by a variety of factors including variables measured and differences in population characteristics (students, children, pregnant women or elderly population), as well as use of different drug groups and period over which self-medication was reported (lifespan or a defined period of time) that complicate data comparison (1-15).

A similar pattern is associated with self-medication throughout life, in the previous 30 days and with the intention to self-medicate; the following variables were all predictors of self-medication: Storing drugs at home, recommending drugs and a favorable attitude towards taking drugs without a medical prescription. A favorable attitude was significantly associated with the first two factors, making it important to determine in future studies whether

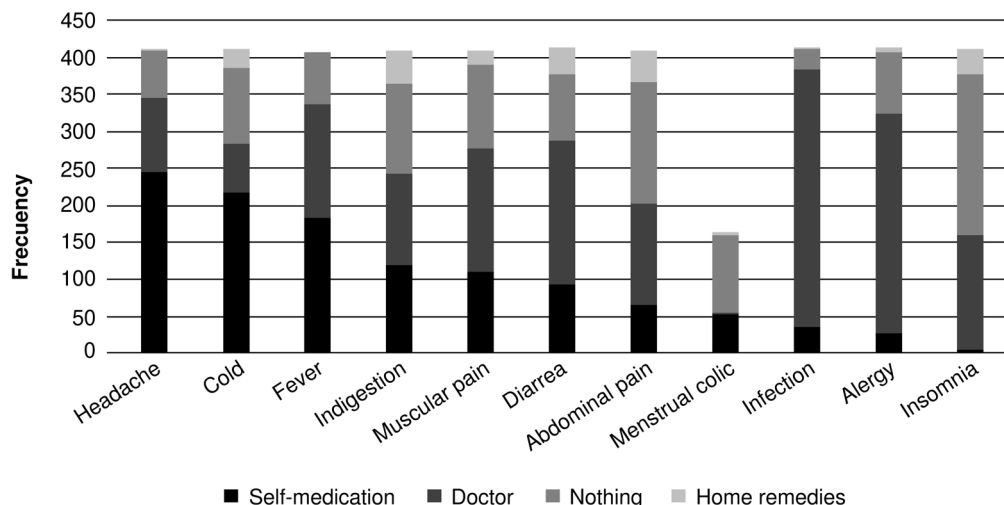


Figure 2. Conduct likely to be followed by the 414 people surveyed about the possibility of self-medication against each of the symptoms assessed in Pereira, Colombia, 2013

Table 4. Top five pharmaceutical groups used for self-medication to counter symptoms investigated in Pereira, Colombia, 2013

Medicine	Flu		Fever		Diarrhea		Allergy		Infection		Insomnia		Indigestion		Muscle pain		Headache		Abdominal pain		Menstrual colic	
	n=274	%	n=196	%	n=140	%	n=35	%	n=41	%	n=39	%	n=189	%	n=143	%	n=272	%	n=116	%	n=57	%
Analgesics	99	36.1	153	78.1	1	0.7									45	31.5	165	60.7	13	11.2	1	1.8
Home remedies	34	12.4	5	2.6	32	22.9	6	17.1	3	7.3	35	89.7	40	21.2	6	4.2	2	0.7	47	40.5	5	8.8
NSAID	15	5.5	15	7.7	1	0.7			1	2.4			4	2.1	49	34.3	96	35.3	3	2.6	25	43.9
Antiacids*					3	2.1							124	65.6	1	0.7	1	0.4	6	5.2		
Influenza	115	42.0	15	7.7													2	0.7				

* Drugs to treat disorders caused by acids

favorable attitude to self-medication is the main factor, with storing and recommending drugs as part of the behavioral manifestation of this attitude, or vice versa.

More than half the sample said they stored drugs and this home medicine cabinet constituted one of the main sources of the drugs used to self-medicate. The most frequently stored drugs corresponded to those most commonly used in self-medication over the last 30 days and to those people would use if they intended to self-medicate for certain symptoms. Another study showed that one third of the people stored drugs under inadequate conditions in their homes and that it was common to find expired medication in medicine cabinets, especially at the houses of individuals who practiced self-medication (4).

The results show a difference between rates of self-medication in people older than 60 years and other age groups. The older group showed lower rates of intention to self-medicate, a fact that needs further

investigation in order to understand the underlying reasons. Evidence found with respect to sex is contradictory, some studies have indicated that there is no difference between men and women with respect to self-medication (4), but others indicate that women self-medicate more frequently (5) or less frequently (16).

The results from this study support the hypothesis that young people self-medicate more frequently than older people and that this practice diminishes with age (3,9). A cohort follow-up study in Brazil showed that rates of self-medication in children were higher amongst those whose parents administered drugs from a younger age, demonstrating how this phenomenon originates at early ages and is learned as a family cultural habit (6).

It is important to take into account the number of people surveyed who considered self-medication was “inadequate but necessary” or adequate if the symptom was “mild” or the drug to use was

“well-known”; these qualifying conditions have already been described as the best predictor of self-medication (7). The problem is that there may be inter-individual variability in criteria for symptom severity or the consensus about the appropriate drug. A study of pregnant women in Peru showed that although 97.0% thought self-medication was risky for their own health and their baby’s health, 10.5% self-medicated during the pregnancy, indicating that an attitude “in favor” or “against” self-medication is not necessarily the determining factor in self-medication behavior and drug consumption (8).

The proportion of people with high level of education who self-medicated for more than 50% of the symptoms surveyed and those who had self-medicated at least once in their life was significantly greater in comparison to other groups, in line with the results found with European populations, perhaps indicating a clearly established behavior (9). Socioeconomic level and type of affiliation to the SGSSS were not significantly associated with self-medication, a surprising finding as these variables have been important in other studies (10).

As the World Health Organization (WHO) indicates, responsible self-medication is a practice that arises from the modern concept of self-care, by which a population that is more and more well-informed and up-to-date tries to gain more control of its health (11). Our results show that educated people really do have a more favorable attitude to use of drugs without medical prescription and, therefore, they self-medicate more frequently.

The most commonly used drugs for self-medication in this study, i.e., analgesics (including anti-flu drugs), NSAIDs and antihistamines, are also the most prevalent in worldwide studies (1,4,12-17) and are related to the problems for which people self-medicate. Some authors argue that this is because analgesics/antipyretics constitute the first line of medical intervention in many communities (15). For pathologies that present with pain and fever these over-the-counter (OTC) medicines allow symptomatic management (18), even though there is increasing concern about their indiscriminate use due to adverse reactions and the possibility of masking severe illness (8,12,19,20).

The reasons given for self-medicating included barriers to healthcare access, “lack of time” and difficulties in securing a medical consultation due to “administrative delays”; other reasons that have been found in international studies were also reported by our sample, including economic factors, repetitive

prescription patterns in primary health consultations and a negative perception of the healthcare system (8,10,15,20-23). The WHO has considered these motives when designing strategies to encourage responsible self-medication (24).

An important tendency for people to get information about drugs from their relatives and previous prescriptions was observed in this and other studies (16,20), this shows the extent to which people trust others with no medical knowledge and their own experience with drugs, a phenomenon that is common to countries with low and high incomes (2,6,16). Some authors have indicated that this might happen as a way of overcoming obstacles to getting medical care or as result of dissatisfaction with it (16).

The prevalence of the intention to self-medicate is higher than that of self-medication behavior throughout life and during the previous month. This indicates that people who have never self-medicated are at high risk of self-medicating in the future, which may lead to an increase in this practice. The study asked about intention to self-medicate for specific symptoms, taking into account that self-medication is carried out according to the perceived severity of each symptom. One study demonstrated that self-medication is more likely when problems are perceived as “minor” and over-the-counter (OTC) drugs are available for a specific pathology (25).

This work shows the high rate of self-medication in a Colombian city both throughout life and during the previous month, as well as the sociocultural and economic factors associated with this practice. The act of carrying out self-medication is not detrimental in itself; the initiative by the World Self-Medication Industry (WSMI) shows that in order to achieve good self-care when pertinent (22) OTC drug education is essential; this eliminates erroneous conceptions that may lead to inadequate drug use (2,14). This is the reason why self-medication characterization studies are needed: To determine which areas must be worked on to prepare a population for effective self-care. This type of study is recommended in other cities to learn more about this practice and to intervene it and its determining factors.

Intention to self-medicate has not been studied frequently and when it has, it is usually done in a very general way. Our survey asked specifically about intention to use drugs without a medical prescription for specific symptoms, allowing us to observe differences among the reasons for probable

self-medication in each case. The results show how symptom type, perception of symptom severity and knowledge of drugs associated with such symptoms are determining factors in carrying out self-medication and having the intention to self-medicate.

The limitations of this study include having a sample restricted to one city in Colombia, that self-medication in children was not assessed and that no information was gathered on dose used or adverse effects that might have occurred in those who took drugs without medical prescription.

Acknowledgments

To German Moreno, Percy Mayta-Tristán, Alfonso Rodríguez-Morales, Carlos Alberto Isaza, José William Martínez y Diego Roselli for their advice during the development of the IRIS-AM instrument.

Financing

The study was funded totally by Audifarma S.A.

Conflict of interest

One of the authors has a contractual relationship with the financing company (Audifarma S.A.) without this affecting the manuscript contents.

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