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PATTERNS OF ANTIBIOTIC USE AT THE COMMUNITY LEVEL BY INHABITANTS OF A NEIGHBORHOOD IN A CITY IN NORTHERN COLOMBIA

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Abstract
Awareness about the problem of bacterial resistance has been increasing, but there are situations that still occur, such as prescribing antibiotics without laboratory tests at hand to ensure that it is an infection caused by bacteria. In addition, there are patients who pressure the doctor to prescribe antibiotics, thinking that they will receive quick relief from the symptoms without considering the cause of the disease. Indiscriminate use of these drugs has caused serious public health difficulties in Colombia. The objective of this study was to characterize the use of antibiotics at the community level by the inhabitants of the Nuevo Majagual neighborhood in Sincelejo-Sucre in 2022. This study had an observational, descriptive, cross-sectional, and nonexperimental design. To do this, a questionnaire was administered to 200 adults, inhabitants of the Nuevo Majagual neighborhood of the city of Sincelejo-Sucre. Among the most relevant results, it is worth mentioning that 68.5% of those surveyed acknowledged self-medication in the said period, despite the fact that 97% of those surveyed claimed to believe that this practice is a health risk. Furthermore, 46.5% of those who reported having self-medicated justified that they had done so because "the illness was not serious" while 12.5% said it was "due to lack of time to see a doctor," and the rest for other reasons. The complaints that most motivated this practice were fever (32%), sore throat (11.5%), general malaise (11.5%), flu (6%), headache (3.5%), skin conditions (3%), cough and diarrhea (1%), and 30.5 say they do not self-medicate. The main place where they went to purchase non-prescription medications was health establishments (61.5%), followed by pharmacies (27%). On the other hand, 60% of those who self-medicated claimed to know the unfavorable effects of medications they have consumed without prescriptions. In summary, self-medication is a recurrent practice in the population studied.

Keywords: Self-medication, Microbial resistance to antibiotics, public health.

1. Introduction

Antibiotics are important drugs that fight bacterial infections in humans and animals and their abusive use is one of the main causes of the increase in bacterial resistance, one of the major public health problems, thus generating unnecessary expenses for health systems [1-3].

Bacteria frequently acquire resistance to antibiotics, and the indiscriminate way in which antibiotics are used favors the degree of bacterial resistance and the speed with which they acquire it. A bacterium is said to be resistant to an antibiotic when no inhibitory effect or elimination of the microorganism causing a disease is observed. If the bacterium is able to survive antibiotic treatment, it can multiply and transmit this genetic information of resistance to bacteria of other species, which will also develop resistance [2,5-7].

The Center for Disease Control and Prevention reported that in 2013, approximately two million people per year had serious infections caused by bacteria resistant to one or more of the antibiotics selected to treat such infections, and approximately 23,000 people die each year from infections caused by antibiotic-resistant bacteria, which has become a serious problem for the health sector [2,8,9,14].

Awareness of the problem of bacterial resistance has been increasing, but there are situations that still occur, such as prescribing antibiotics without having laboratory tests to ensure that it is an infection caused by bacteria. Also, there are patients who pressure the doctor to prescribe antibiotics thinking that they will obtain a quick relief of the symptoms, without considering the cause of the disease. In this order of ideas, self-diagnosis is an extremely important aspect, since some people rely on information obtained from the Internet that sometimes is not reliable and self-medicate, taking drugs that are not the right ones or even worse that are left over from previous treatments [3,10-13].

In that order of ideas, the indiscriminate use of these drugs generates this problem, which has already been reported in Colombia [6,15,23,25]. According to the report of the National Institute of Health about the Laboratory Surveillance Program of Antimicrobial Resistance in Healthcare-Associated Infections (IAAS) 2016, among other findings, Carbapenemase-producing bacteria have been identified, a family of bacteria that mostly live naturally in our intestine, these have the ability to destroy very potent antibiotics, thus resisting the effect of them [3,23,25].

In Colombia, according to figures provided by the Ministry of Health, Escherichia coli was the second most frequent microorganism in the ICU service (15.9 %) and the most frequent in non-ICU hospitalizations (28.3 %). Another bacterium, Klebsiella sp., S. pneumoniae, is at its center [4,15-16]. It is an intestinal bacterium capable of producing pneumonia, septicemia or infecting neonatal and intensive care patients. In the Colombian ICU service, Klebsiella sp had a frequency of 16.2%, and in hospitalization (non-ICU) of 11.8%. The Ministry's report also says that in the field of Gram-positive bacteria for 2017, an increase was observed in terms of the percentages of resistances reported by non-ICU and ICU services compared to what was found in 2016 [4, 17, 18, 22].

However, the vast majority of the information reported in these studies was obtained from data obtained from institutions that are part of the National Public Health Surveillance System. It is worth mentioning that they are hospital based in nature and fail to reflect the dimensions of antibiotic use in the community. [19, 20-23].

Similarly, although many studies have been conducted on the use of antibiotics in the country, there is not much information on the department of Sucre and the municipality of Sincelejo [25,26].

Considering the above context, this study aimed to determine the factors with the highest incidence of self-medication. The use of antibiotics at the community level by the inhabitants of the Nuevo Majagual neighborhood in the municipality of Sincelejo, Department of Sucre, was used as a reference. The results obtained were used as a reference to propose a health education program related to the use of antibiotics by the inhabitants of the aforementioned neighborhood.

2. Materials and Methods

2.1 Type of study

An observational, descriptive, cross-sectional, and non-experimental study was conducted.

2.2 Population and sample

The population consisted of inhabitants of the community of the Nuevo Majagual neighborhood in the city of Sincelejo of strata one, two, and three. This neighborhood has 1378 inhabitants [27-29].
The sample comprised of two hundred (200) inhabitants. To calculate the sample size, the number of inhabitants in the neighborhood was determined using the platform of the National Administrative Department of Statistics (DANE) (https://www.dane.gov.co/) through the Geoportal option. Detailed information from the 2018 census was consulted for sectors and census blocks, the location option was chosen, and the department-municipality and class (head) were selected.

Subsequently, the option subjects (population) were used, and the age range was selected. The neighborhood to be investigated was then located on the map published by DANE, considering and identifying the area by blocks, for which Google Maps was used. As a final option, the blocks that made up the neighborhood were selected by age range, and the numerical value of inhabitants by age was obtained.
To calculate the sample size, Open Epi software and the following formula were used:

$$n = \frac{Z^2 * p * q * N}{e^2 (N-1) + Z^2 * p * p} \qquad \text{Ec. 1}$$

Where n is the sample, p is the probability in favor, q is the probability against, z corresponds to the confidence level, e is the sampling error, and N is the population. All results had a confidence interval of 95% and a margin of error of 5%–5%.
The study participants were chosen by simple sampling using a random number technique. The sample size included 301 individuals. It is worth mentioning that several inhabitants refused to sign the informed consent form; therefore, they could not be included in the study. Therefore, only 200 participants were able to participate in the study, for whom the questionnaire established for the collection of information was administered.

2.3 Inclusion and exclusion criteria

Participants who met the following requirements were included in the study: being older than 18 years, being inhabitants of the Nuevo Majagual neighborhood, and consenting to participate in the study.
Individuals who were under the influence of psychoactive substances and had communication limitations were excluded from the study.

2.4 Techniques and instruments for data collection, processing, presentation and analysis.

For the collection of information, a structured questionnaire adapted from the original created by Rueda (2014) (24) was administered to inhabitants of commune four, residents of the Nuevo Majagual neighborhood of Sincelejo-Sucre.
Information processing was performed by creating an anonymized database from the information collected using Microsoft Office Excel software.

The analysis of the data was performed using IBM SPSS version 22 statistical package. The collected data were subjected to an exploration process to debug and adjust the database, including the performance of normality tests. Subsequently, a description of the data was made through frequency analysis, and finally, a comparative analysis was made between variables using the Chi-square and

Cramer's V statistics, seeking to establish dependence between variables and the magnitude of the effect.

The study complied with the Declaration of Helsinki, which establishes the ethical principles for research on human subjects, and Resolution 8430 of 1993. It was classified as research without risk, according to Article 11 of the latter resolution. In addition, the application of the questionnaire required informed consent from the participants.

3. Results

The measurements obtained from the participants for the variables included in this study are shown in Table 1.

Table 1. Characteristics of the participants

Variable		**Frequency**	**Percentage**
Age	18 - 28 years	68	34
	29 - 39 years	46	23
	40 a 50 years	28	14
	51 a 60 years	29	14.5
	> 60 years	29	14.5
Sex	Woman	130	65
	Man	70	35
Educational level	Without Studies	2	1
	Primary	34	17
	High School	86	43
	University	78	39
Occupation	Employee	55	27.5
	Housewife	65	32.5
	Student	42	21
	Other	38	19
Marital status	Not living with a partner	103	51.5
	Lives with a partner	97	48.5
Religion	Catholic	139	69.5
	Evangelical	39	19.5
	No Religion	19	9.5
	Other	3	1.5
Ethnicity	Mongrel	155	77.5
	Caucasian	3	1.5
	Afro-Colombian	6	3
	Native	25	12.5
	Other	11	5.5
Monthly income	$100.000 to $300.000	33	16.5
	$400.000 to $600.000	48	24
	$700.000 to $900.000	50	25
	> $1.000.000	69	34.5
Total		**200**	**100**

It is worth mentioning that most of the participants were between 18 and 28 years of age (34%); they were predominantly female (65%); their most frequent level of education was secondary school (43%); most of them were housewives (32.5%); and 51.5% did not live with a partner.

The religion most commonly professed by the participants was Catholic (69.5%), with respect to their ethnicity; 77.5% of the inhabitants recognized themselves as mestizos, and 34.5% had an income of more than one million pesos ($1,000,000) per month.

On the other hand, when trying to determine whether these characteristics influenced the self-medication of antibiotics, bivariate analysis showed that there was no statistically significant dependence between the sociodemographic variables and the practice of self-medication with antibiotics ($p > 0.05$) (see Table 2).

Regarding the patterns of community use of antibiotics, the study established that the prevalence of self-medication for this type of medication among the inhabitants of the Nuevo Majagual neighborhood who participated in the study was 68.5% (Figure 1). In addition, 86% of participants identified self-medication as the use of medicines without medical prescriptions (Table 2).

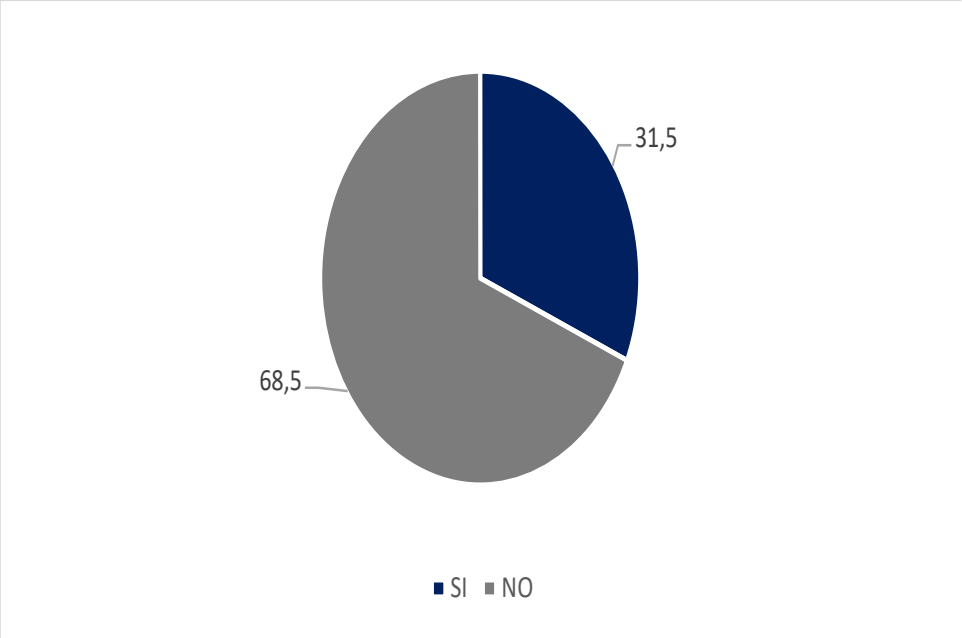

Figure 1. Consumption of antibiotics without medical prescription in percentages

However, it was also possible to determine that the antibiotic most consumed without a medical prescription was amoxicillin (42 %), followed by cephalexin (20.0 %) (Figure 2).

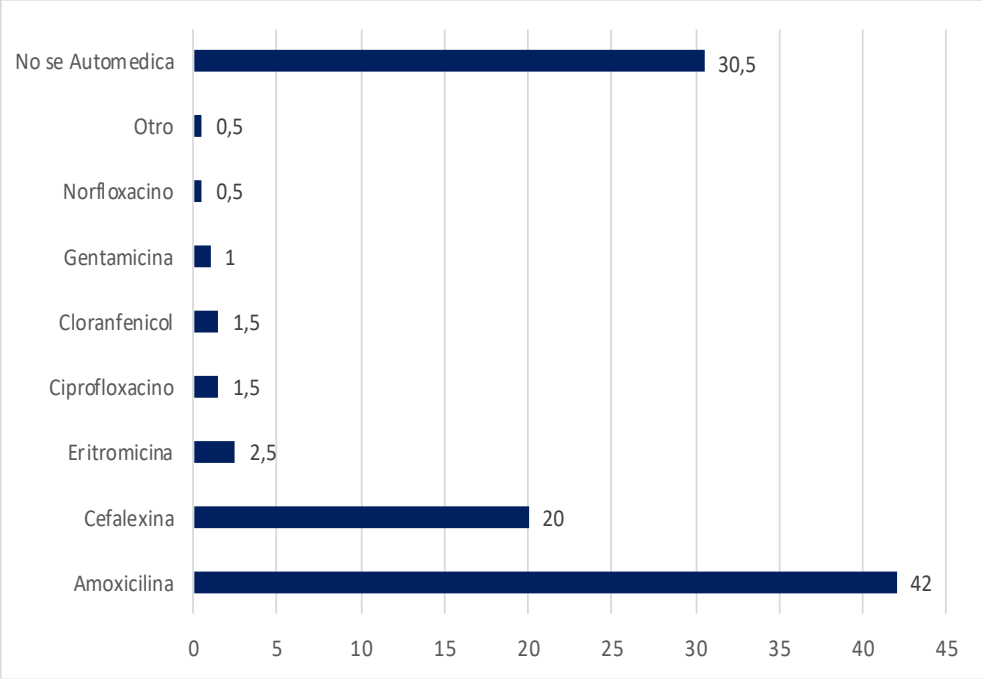

Figure 2. Percentage of antibiotics used without a medical prescription

In this order of ideas, it was possible to determine that the main reason why the participants self-medicated antibiotics was because the disease was not serious (46.5%), being used by them with a frequency of every six months or longer (42%) (Table 2).

The type of discomfort for which antibiotics were most frequently self-medicated was fever (32 %), with pharmacies being the most common place to purchase antibiotics (83 %) (Table 2).

Similarly, 42% of those surveyed claimed to consult doctors one to two times a year, with Health Establishments being the place where they visit in case of illness (61.5%) (Table 2). Regarding the means by which basket recipients determine what antibiotics are for, the main one is the Internet (56.5%). The study also identified that pharmacists most frequently recommended antibiotics (37%). It is worth mentioning that 60% of those surveyed claim to know the adverse effects of antibiotics, while 97 % perceive that its use without a medical order represents health risks (Table) 2.)

On the other hand, the bivariate analysis carried out using the Chi square statistic showed that self-medication of antibiotics has a statistically significant relationship ($p<0.05$) with the variables: reason for self-medication of antibiotics, frequency of antibiotic use, types of discomfort for which uses antibiotics, most used antibiotic, acquisition of antibiotics, frequency of consultations with the Doctor, place where you go when you are sick, Means used for self-medication of Antibiotics and Who Recommends Antibiotics (Table 2).

Similarly, it was possible to determine the variables that showed a strong degree of association with antibiotic self-medication (Cramer's $V > 0.6$), reason for self-medication (0.977), frequency of antibiotic use (0.977), types of discomfort for which they were used (0.979), and most used antibiotics (0.977) (see Table 2).

Table 2. Bivariate analysis of patterns of community antibiotic use

Variables in the equation		Self-medication of Antibiotics				Total	%	χ^2	Cramer`s V	P-value
		Not	%	Yes	%					
Sex	Man	21	30.00%	49	70.00%	70	35.00%	0.112	0.024	0.873
	Woman	42	32.31%	88	67.69%	130	65.00%			
Age	18 - 28 years	17	25.00%	51	75.00%	68	34.00%	4.81	0.155	0.307
	29 - 39 years	12	26.09%	34	73.91%	46	23.00%			
	40 - 50 years	10	35.71%	18	64.29%	28	14.00%			
	51 - 60 years	12	41.38%	17	58.62%	29	14.50%			
	> 60 years	12	41.38%	17	58.62%	29	14.50%			
Marital status	Not living with a partner	36	37.11%	61	62.89%	97	48.50%	2.751	0.117	0.097
	Lives with a partner	27	26.21%	76	73.79%	103	51.50%			
Occupation	Employee	17	30.91%	38	69.09%	55	27.50%	1.605	0.09	0.658
	Housewife	23	35.38%	42	64.62%	65	32.50%			
	Student	14	33.33%	28	66.67%	42	21.00%			
	Other	9	23.68%	29	76.32%	38	19.00%			
Educational level	Without Studies	1	50.00%	1	50.00%	2	1.00%	0.52	0.051	0.915
	Primary	11	32.35%	23	67.65%	34	17.00%			
	High School	28	32.56%	58	67.44%	86	43.00%			
	University	23	29.49%	55	70.51%	78	39.00%			
Ethnicity	Mongrel	50	32.26%	10	67.74%	155	77.50%	2.044	0.101	0.728
	Caucasian	1	33.33%	2	66.67%	3	1.50%			
	Afro-Colombian	3	50.00%	3	50.00%	6	3.00%			
	Native	7	28.00%	18	72.00%	25	12.50%			
	Other	2	18.18%	9	81.82%	11	5.50%			
Religion	Catholic	46	33.09%	93	66.91%	139	69.50%	5.942	0.172	0.114
	Evangelical	8	20.51%	31	79.49%	39	19.50%			
	No Religion	9	47.37%	10	52.63%	19	9.50%			
	Other	0	0.00%	3	100.00 %	3	1.50%			
Monthly income	$100.000 to $300.000	10	30.30%	23	69.70%	33	16.50%	0.806	0.063	0.848
	$400.000 to $600.000	13	27.08%	35	72.92%	48	24.00%			
	$700.000 to $900.000	16	32.00%	34	68.00%	50	25.00%			
	> $1.000.000	24	34.78%	45	65.22%	69	34.50%			

Variables in the equation		Self-medication of Antibiotics				Total	%	χ^2	Cramer`s V	P-value
		Not	%	Yes	%					
Reason for self-medication of antibiotics	Because the illness was not serious	2	2.15%	91	97.85%	93	46.50%	190.93	0.977	0
	Because I don't have money to buy the prescription	0	0.00%	2	100.00%	2	1.00%			
	Because I have enough knowledge to prescribe myself	0	0.00%	14	100.00%	14	7.00%			
	Due to lack of time to see a doctor	0	0.00%	25	100.00%	25	12.50%			
	Because I live very far from a hospital	0	0.00%	1	100.00%	1	0.50%			
	Other motives	0	0.00%	4	100.00%	4	2.00%			
	I don't self-medicate	61	100.00%	0	0.00%	61	30.50%			
Self-medication concept	Use of medications	52	30.23%	120	69.77%	172	86.00%	1.019	0.071	0.907
	Use of previously prescribed medications	3	42.86%	4	57.14%	7	3.50%			
	Taking medications without knowing their side effects	1	33.33%	2	66.67%	3	1.50%			
	Take medications to relieve any symptoms	4	40.00%	6	60.00%	10	5.00%			
	Buy prescription medications	3	37.50%	5	62.50%	8	4.00%			
Frequency of use of antibiotics	Each 15 days	0	0.00%	3	100.00%	3	1.50%	190.95	0.977	0
	Each month	0	0.00%	18	100.00%	18	9.00%			
	Every 2 to 5 months	0	0.00%	34	100.00%	34	17.00%			

Variables in the equation		Self-medication of Antibiotics				Total	%	χ^2	Cramer`s V	P-value
		Not	%	Yes	%					
	Every 6 months or more	2	2.38%	82	97.62%	84	42.00%			
	I did not self-medicate	61	100.00%	0	0.00%	61	30.50%			
Types of Discomfort for those who use them	Fever	0	0.00%	64	100.00%	64	32.00%	191.54	0.979	0
	Diarrhea	0	0.00%	2	100.00%	2	1.00%			
	Cough	0	0.00%	2	100.00%	2	1.00%			
	Sore throat	2	9.52%	21	91.30%	23	11.50%			
	Headache	0	0.00%	7	100.00%	7	3.50%			
	General discomfort	0	0.00%	23	100.00%	23	11.50%			
	Flu	0	0.00%	12	100.00%	12	6.00%			
	Skin Conditions	0	0.00%	6	100.00%	6	3.00%			
	I don't self-medicate	61	100.00%	0	0.00%	61	30.50%			
Most used antibiotic	Amoxicillin	2	2.38%	82	97.62%	84	42.00%	190.95	0.977	0
	Erythromycin	0	0.00%	5	100.00%	5	2.50%			
	Cephalexin	0	0.00%	40	100.00%	40	20.00%			
	Gentamicin	0	0.00%	2	100.00%	2	1.00%			
	Ciprofloxacin	0	0.00%	3	100.00%	3	1.50%			
	Norfloxacin	0	0.00%	1	100.00%	1	0.50%			
	Chloramphenicol	0	0.00%	3	100.00%	3	1.50%			
	Other	0	0.00%	1	100.00%	1	0.50%			
	I don't self-medicate	61	100.00%	0	0.00%	61	30.50%			
Acquisition of Antibiotics	Pharmacy	48	28.92%	118	71.08%	166	83.00%	11.205	0.237	0.011
	Health establishments	11	55.00%	9	45.00%	20	10.00%			
	Store	2	16.67%	10	83.33%	12	6.00%			
	Others	2	100.00%	0	0.00%	2	1.00%			

Variables in the equation		Self-medication of Antibiotics				Total	%	χ^2	Cramer`s V	P-value
		Not	%	Yes	%					
Frequency of consultations with the Doctor	None	2	8.33%	22	91.67%	24	12.00%	14.263	0.267	0.003
	1 to 2 times	22	26.19%	62	73.81%	84	42.00%			
	3 to 6 times	21	36.84%	36	63.16%	57	28.50%			
	7 to more times	18	51.43%	17	48.57%	35	17.50%			
Place where you go when you are sick	Pharmacy	3	5.56%	51	94.44%	54	27.00%	26.765	0.366	0
	Health facility	49	39.84%	74	60.16%	123	61.50%			
	To a family member	6	40.00%	9	60.00%	15	7.50%			
	To a Neighbor	1	33.33%	2	66.67%	3	1.50%			
	Others	4	80.00%	1	20.00%	5	2.50%			
Medium used for self-medication of Antibiotics	Television	3	20.00%	12	80.00%	15	7.50%	14.252	0.267	0.003
	Newspaper	1	100.00 %	0	0.00%	1	0.50%			
	Web	26	23.01%	87	76.99%	113	56.50%			
	Other	33	46.48%	38	53.52%	71	35.50%			
Who Recommends Antibiotics	Pharmacist	15	20.27%	59	79.73%	74	37.00%	32.244	0.402	0
	Regent pharmacy	6	50.00%	6	50.00%	12	6.00%			
	A Family Member Who Knows About Medications	10	29.41%	24	70.59%	34	17.00%			
	Myself	3	10.00%	27	90.00%	30	15.00%			
	A Neighbor Who Had a Similar Illness	0	0.00%	2	100.00 %	2	1.00%			
Knowledge about Adverse Effects of Antibiotics	No	21	26.25%	59	73.75%	80	40.00%	1.703	0.092	0.216
	Yes	42	35.00%	78	65.00%	120	60.00%			
Health Risk Perception	No	3	50.00%	3	50.00%	6	3.00%	0.981	0.07	0.382
	Yes	60	30.93%	134	69.07%	194	97.00%			
Total		**63**	**31.50 %**	**137**	**68.50 %**	**200**	100.00 %			

Based on the findings, a proposal for an educational program structured in four stages was constructed:
Stage 1: Recognition of the population and use of antibiotics.
Stage 2: Preparation of teaching materials.

Stage 3: Organization of educational strategies for the inappropriate use of antibiotics.
Stage 4: Evaluation of the educational intervention.
The general structure of the educational program is presented in Table 3.

Table 3. General structure of the educational program

Stages	Methodological Tool
1. Recognize the population and their experiences regarding the issue of antibiotic use.	Questionnaire (information collected in the research work)
2. Prepare educational and understandable material for the public for the rational use of antibiotics.	Brochure, dynamics, banners.
3. Organize educational strategies on the inappropriate use of antibiotics.	Talks, videos, role plays, dramatizations.
4. Evaluation of the educational intervention	Practical problematic situations for resolution by the participants.

4. Discussion

Self-medication is the practice of taking medication without medical examination or diagnosis. If medications are used responsibly to treat minor symptoms such as pain, fever or heartburn, there are no problems. Problems arise when they are taken for a long time, we abuse the recommended amount, or we do not have knowledge about the true effect of the drug [27,28,30].
Firstly, the prevalence of self-medication of antibiotics in the Nuevo Majagual neighborhood of the municipality of Sincelejo was 68.5%, this value is noticeably lower than that obtained by Morales et al. [29], who found that 80% of the participants reported having consumed antibiotics without a medical prescription in the city of Bogotá [31].
In this order of ideas, 46.5% of the study participants stated that they self-medicated because the disease was not serious, a fact that is related to the findings of Morales et al., who were able to see that the inhabitants of the town of Bose in Bogotá do not recognize antimicrobial resistance as a threat to humanity [31]. It is worth emphasizing that 86% of study participants identified self-medication as the use of medications without a prescription.
On the other hand, it was determined that 83% of the individuals who were part of the study acquired antibiotics in pharmacies, 37% of which were recommended by the pharmacist. These facts contrast with what was identified by Morales et al., who found that 100 % of those surveyed consume antibiotics recommended by their family or friends, this is because the person who recommended the treatment worked for them [31].
Likewise, it was determined that 61.5% of the participants went to health facilities when they felt sick, an aspect that differs substantially from that established by Morales et al., who showed that all individuals preferred to self-medicate rather than attend. Delays in medical appointments have led to consultations at medical facilities.
The study carried out with the inhabitants of the Nuevo Majagual neighborhood showed that the Internet is the most used medium for queries related to the use of antibiotics by 56.5%, these data support what was found by Morales et al., who observed that 100% of people consider that the mass media influences the purchase of medications by seeing them on television or listening to them on the radio [31].
It is worth mentioning that the antibiotic most used by the participants was Amoxicillin (42%), followed by Cephalexin (20%), a fact that agrees with what was found by Borreo et al. [32], who announced that the antibiotics most purchased without a medical prescription in Barranquilla are amoxicillin (31.92%) (n=68), azithromycin (18.78%) (n=40), Cephalexin (15 .02%) (n=32).
In this sense, in the community of the Nuevo Majagual neighborhood, it was possible to determine that 70% of men were self-treated with antibiotics, while 67.69% of women did so; these values are

considerably higher than those reported by Borreo et al., who found that the final recipient of the antibiotic was more frequently female (53.99%) (n=115) [32, 35].
Finally, the results reported in this research show that fever (32%) (n=64), followed by sore throat and general malaise, both with (11.5%) (n=23), are the symptoms why the inhabitants of the Nuevo Majagual neighborhood self-medicate with antibiotics, contrary to what was found by Borreo et al., who affirm that the most frequent symptom for which they self-prescribed antibiotics was sore throat (32.86%) (n=70), followed by cold or cough symptoms (25.82%) (n=55), skin infections (17.84%) (n=38) and urinary symptoms (14.55%) (n =31) [32-34].

5. Conclusions

Regarding the concept of self-medication, 86% of the surveyed population perceived this as the "use of medications without a medical prescription", which is the most accurate concept. While 5% consider that it is "taking medications to relieve any symptoms" and the rest think that it is "taking medications without knowing their side effects." Furthermore, the prevalence of self-medication among residents of commune 4 of Sincelejo was 68.5%.
According to what was reported by the participants, the main reasons that motivated the practice of self-medication were 46.5% because the disease was not serious, and 12.5% reported that it was due to lack of time to go to the doctor. Furthermore, 42% stated that they went to the doctor every six months or more, followed by 17% who said they did so every two to five months, 9% every 15 months, 1.5% every 15 days, and the rest did not self-medicate.
Regarding the type of discomfort that motivates self-medication, 32% were fever-motivated self-medication. The main place where they acquired medications without a prescription was pharmacies (83%). However, the first place where respondents went in the case of illness was health facilities (61.5 %). The pharmacist was the person in charge of recommending antibiotics to the respondents, with 37% and 24% consulting other options.
In conclusion, self-medication with antibiotics had a statistically significant relationship ($p<0.05$) with the following variables: reason for self-medication with antibiotics, frequency of use of antibiotics, types of discomfort for which antibiotics are used, most used antibiotics, acquisition of antibiotics, frequency of doctor visits, place where you go when you are sick, means used for self-medication with antibiotics, and who recommends antibiotics.

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