



## ASSESSMENT OF KNOWLEDGE, ATTITUDE AND PRACTICE REGARDING ANTIBIOTICS MISUSE AMONG THE PUBLIC IN SAUDI ARABIA

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### Abstract

**Background:** improper use of antibiotics lead to one of the serious problems of bacterial resistance.

**Aim:** to assess the frequency of antibiotic use and to obtain information about antibiotic prescription, in two centers in Northern Lima, Peru.

**Methods:** it is cross sectional study using a self-administered questionnaire.

**Results:** 1961 surveys were considered, Two thirds received antibiotics in the last year, to obtain these drugs, were prescribed by a physician, most of physicians agreed in the importance of inadequate use of antibiotics and 85.1% prescribed antibiotics more than once every day. Internet is a useful resource of information as suggested by physicians to develop educative programs about use of antibiotics.

**Conclusions:** No enough knowledge about adequate use of antibiotics in the community, three quarters would go to hospital if they presented upper respiratory tract symptoms and half received an antibiotic prescription by the physician, if physicians prescribed antibiotics more than once every day, it leads to resistance.

**Keywords:** Knowledge, attitudes, practices, antibiotics, resistance

### Introduction:

The development of antibiotic resistance has two fundamental components: the biological, that is, the intrinsic characteristics of microbes and their responses to antibiotics and aspects related to the use of these drugs, such as the quality of prescription, the prescriber, the user and the dispenser. (1)

As for the prescribing physician, in the United States, they inquired about the knowledge, attitudes and practices of 36 primary care physicians through telephone interviews; and it was found that there is a preference for the use of broad spectrum antibiotics (2). In other context, when evaluating the knowledge of prescribing physicians, in a study conducted

in Shanxi-China, through surveys of doctors of the third, second and first level of Attention; It was observed that based on a maximum score of 10 points, the average of the 761 physicians surveyed was 6.29 points (SD = 1.79) and that those who work in the two first levels have a lower degree of knowledge compared to those who work in the third level of care (3). This suggests that there are limitations when prescribe antibiotics.

Another important element is the user, as observed in a research carried out in Colombia, where the characteristics of obtaining these drugs were investigated in local pharmacies in the city of Bogotá. It was carried out through surveys and it was found that a 56.8% of people obtained the drug with a prescription, while the 43.2% did not present the prescription at the time of purchase. Of

this last percentage, 35.1% of the antibiotics were recommended by a relative, 28.6% were self-prescribed and 26.4% were recommended by the pharmacy vendor (4); while in a study carried out in El Callao-Peru, it was found that 75.5% of respondents were taking antibiotics without a prescription, of these 43.5% were self-medicated, 33.7% on the recommendation of the pharmacist, 12.7% from a relative, 5.8% from the pharmacy vendor and 4.3% from a neighbor or friend (5). This suggests that there are various factors that influence the attitudes and practices of the population with respect to antibiotics

This situation constitutes a public health problem worldwide and this has been seen reflected in strategies proposed by the World Health Organization and initiatives specific to each country, which set goals in terms of reducing prescription of antibiotics in hospitalized and outpatient patients, restricting it to cases strictly necessary and also the development of educational interventions in the population, and thus protect the efficacy of these drugs against infections in humans.

For all the above, it is justified to carry out a study about the knowledge, attitudes and practices about the use of antibiotics, in a community that uses the services of health and doctors from primary care health centers in North Lima; with the purpose of obtaining information on such relevant aspects, to carry out a vigilance regarding the inappropriate use of these drugs and develop strategies that allow to propose and carry out educational interventions within the community to promote the appropriate use of such drugs.

#### **General objective:**

Describe the knowledge, attitudes and practices that determine the use of antibiotics between adult users of health services and physicians at two health centers. primary care in North Lima, belonging to the districts of Independencia and the Olives.

#### **Specific objectives:**

Compare the use of prescription and non-prescription antibiotics in the population studied.

Obtain information about the prescription and use of antibiotics at the first level health care and in certain clinical cases.

#### **Material and methods**

##### **Study design:**

A descriptive cross-sectional observational study was carried out, through the application of surveys (see annexes), carried out by a work team, made up of graduates in Nursing; within the framework of the project . (7)

##### **Population:**

Health service users who attended two level I-3 health centers, "Tahuantinsuyo Bajo" located in Independencia and "Juan Pablo II" in Los Olivos, and doctors who worked

in these establishments, The estimated population of the Juan Pablo II health center is of 16,212 inhabitants and that of the Tahuantinsuyo Bajo health center is 33,942 inhabitants, these data were obtained from the consolidated population for both centers of health provided by the northern Lima health network IV.

Each center was selected because it was the only center, in its respective district, that had 24-hour care (emergency service) as well as delivery care, obstetrics and pediatrics service; in addition to medicine service.

#### **Sample:**

##### ❖ Health services users

o Sample selection: Convenience sampling, size not calculated sample, due to the fact that no reference studies were found covering the same theme in our midst. A sample size of 1000 people was assigned per each health center, arbitrarily.

o Inclusion criteria: People aged 18 years or older, users of health services, who request their own care or companions of the patients who were treated in the selected health centers, during the study period.

##### ❖ Doctors

o Selection of the sample: It was applied to all the doctors who worked in each health center, the 17 doctors of John Paul II and the 24 doctors of Tahuantinsuyo Bajo; however, some did not fill it out of their own accord. Finally, 10 doctors from the John Paul II health center and 17 doctors from the Tahuantinsuyo Bajo health center.

o Inclusion criteria: Prescribing physicians who work in said centers of health during the established period.

#### **Operational definition of variables, Survey for users of health services**

##### ❖ Quantitative variable:

Age

##### ❖ Qualitative or categorical variables:

Sex, health center where you were surveyed, having heard about

antibiotics and antibiotic use in the past 12 months, degree of instruction, reason for going to the health center, concept about the antibiotics, identification of antibiotics, reason for antibiotic use and person who prescribed the drug. Additionally, 2 cases with multiple choice answers were included, to evaluate the knowledge, attitudes and practices of the sample studied. The first was about a cold, associated with a sore throat and fever for three days and the second case was a picture of liquid diarrhea without mucus or blood, one day of evolution.

#### **Operational definition of variables: Survey for doctors (see annexes)**

##### ❖ Quantitative variable:

Years of work.

##### ❖ Qualitative or categorical variables:

Function in the health center, importance of knowledge and use of antibiotics, sources for searching information on the antibiotics

Frequency of prescription of antibiotics, teaching sessions on antibiotics, quality of sources of information on antibiotics, overuse of antibiotics in health centers and in the community, selection of the correct antibiotic and factors influencing the selection, antibiotic resistance as a problem in the health center, knowledge about antimicrobial resistance, application for approval for the use of certain antibiotics, usefulness of the development of a guide and committee of antibiotics, educational programs on antibiotics, availability and quality of antibiotics in the health center, damages due to improper prescription of antibiotics and opinion about antimicrobial resistance.

Work area, review of the decision to prescribe antibiotics and confidence when prescribing antibiotics. Also included were three clinical cases and seven knowledge questions about antibiotics and resistance to them, with multiple choice answers. The first case urinary; in the second case, an adult patient was evaluated with tract symptoms upper respiratory tract (rhinorrhea and odynophagia) associated with fever for three days, and the third case involved two patients, both with serious deterioration of renal function: the first was a older adult who suffered from severe cellulitis, treated with intravenous clindamycin; the second was a diabetic adult who received ceftriaxone and gentamicin as therapy empirical for sepsis.

The variables used in this section are independent nominal qualitative and were registered assigning an ordinal alphanumeric code, from 1 onwards, for each answer.

#### Procedures and Techniques:

Within the framework of the project: "Strategies to improve the quality of prescription of antibiotics in primary care physicians and resistance surveillance antimicrobial in community-acquired infections ", which has the approval of the ethics committee; Surveys were conducted in the period from July 2014 to July 2015, by a work team made up of nursing graduates; at people who meet the mentioned inclusion criteria; through a questionnaire semi-structured and validated with the review of 5 experts, on knowledge, attitudes and practices regarding the use of antibiotics and antimicrobial resistance

These surveys were anonymous, so informed consent was not used; in the case of the users of the health services were carried out in the waiting rooms of the outpatient clinics of health centers. 5 to 10 surveys per day were carried out, randomly from Monday to Friday, until the number of the sample (n = 1000) was completed in each health center. In the case of physicians, the surveys were delivered to the prescribing physicians (n = 41) in their respective health centers.

#### Analysis plan:

Descriptive statistical measurements, such as frequency distribution, were performed at through percentages for categorical / dichotomous variables. The program was used Statistical STATA version 11.1.

#### Results

Health services users 1961 surveys were considered, of these 982 were carried out in the health center of Juan Pablo II and 979 at the Tahuantinsuyo Bajo health center. 20.2% (n = 396) of the surveys were completed by men and 79.8% (n = 1565) by women (see table 1);

**Table 1:** Use of antibiotics in health service users

Use of antibiotics	No.	Relative frequency (%)
In the last 12 months	1,319	67.2
More than 1 year, but less than 5 years	511	26.1
More than 5 years	70	3.6
They have never received	51	2.6
Total	1961	100

Average age of the respondents was 34.8 years (Median = 32, IQR = 19). Regarding the educational level: 58.3% (n = 1144) had secondary education, 30.2% (n = 593) had higher education, 10.9% (n = 214) had primary education and 0.5% (n = 10) did not have educational instruction.

Regarding the knowledge about antibiotics, it was obtained that 95.1% (n = 1865) of those surveyed heard of these medications; also, they were asked what function had and it was found that for 21.5% (n = 421) they served to reduce fever, 44.6% (n = 875) believed that they served to kill bacteria, 23.9% (n = 469) responded that they served to relieve pain and 6% (n = 117) answered that they had other uses.

It was asked if users had received antibiotics in the last 12 months, to which 67.2% (n = 1319) answered affirmatively, 26.1% (n = 511) more than a year ago, but less than 5 years, 3.6% (n = 70) more than 5 years ago and 2.6% (n = 51) have never taken antibiotics What motivated the use of antibiotics were the following health problems: 37.5% (n = 736) due to respiratory infection and 28.6% (n = 561) due to urinary infection, the remaining percentage for other diseases. (Table 2)

**Table 2:** Main conditions that conditioned its consumption in users of the Health services

Conditions	No. (%)	Relative frequency (%)
Respiratory infection	736	37.53
Urinary infection	561	28.61
Diarrhea or gastrointestinal infection	236	12.03
Dental infection	113	5.76
Skin infection / cellulitis	92	4.69
Others	176	8.98
No answer	47	2.4

The users received the indication to take antibiotics by the doctor of the center of health in 47.2% (n = 925), 28.9% (n = 567) of a private doctor, 17.9% (n = 350) of the person who attends the pharmacy, 2.1% (n = 42) obtained the medications for their account at the pharmacy and 0.5% (n = 10) took antibiotics that were left over at home (Table 3)

**Table 3:** Person who indicated the use of antibiotics to users of health services.

Person who indicated antibiotics	No.	Relative frequency (%)
Health center doctor	925	47.17
Private physician	567	28.91
Pharmacy clerk	350	17.85
Self-prescription	42	2.14
Neighbor / Friend / Family member	10	0.51
No answer	47	2.4
Total	1961	100.00

To evaluate attitudes and practices, two cases were raised: in the first, it was found that 76.2% (n = 1494) would go to the doctor and 17.7% (n = 347) would go to the pharmacy to ask for a pill make you feel better. (Table 4) It was asked what they would expect to be prescribed or what would take and it was found that 38.4% (n = 754) opted for painkillers in pills (paracetamol, flu, etc.) and 42.6% (n = 836) by antibiotics in pills (amoxicillin, azithromycin).

**Table 4:** Attitudes of the surveyed population towards case 1 (cold, pain in throat and fever for 3 days) and case 2 (liquid diarrhea without mucus or blood for a day whole)

Attitudes	Case 1		Case 2	
	No.	Relative Frequency (%)	No.	Relative Frequency (%)
Go to the doctor				
Stay home for the annoyances pass by themselves	1494	76.19	1008	51.4
Go to the pharmacy and buy a pill	110	5.61	483	24.63
Go to the neighbor or friend	347	17.7	452	23.05
(a) to advise you Drink	9	0.46	17	0.87
No response	1	0.05	1	0.05
Total	1961	100.00	1961	100.00

Finally, it was asked if it should be treated with antibiotics and it was found that 38.1% (n = 748) stated that it was true and 45.5% (n = 892) stated that it was false. (Table 4) In the second case, it was asked what the respondent would do and it was found that 51.4% (n = 1008) would go to the doctor, 24.6% (n = 483) would go to the pharmacy and 23% (n = 452) would stay home and wait the symptoms pass by themselves.

It was also evaluated that they would expect prescribe or what they would take and it was found that 51.4% (n = 1008) would drink homemade liquids, 57.4% (n = 1125) hydrating serum from the pharmacy and 28.9% (n = 567) ciprofloxacin, cotrimoxazole, sulfas or others. In addition, it was asked whether antibiotics would be necessary in this

case, and found that 42.3% (n = 829) indicated yes and 38.8% (n = 760) answered no. (Table 4)

**Table 4:** Knowledge of health users in relation to case 1 (cold, pain throat and fever for 3 days) and case 2 (liquid diarrhea without mucus or blood for a all day)

Treatment with antibiotics	Case 1		Case 2	
	No.	Relative frequency (%)	No.	Relative frequency (%)
True	748	38.14	829	42.27
False	892	45.49	760	38.76
Don't know	317	16.17	369	18.82
No response	4	0.2	3	0.15
Total	1961	100.00	1961	100.00

27 surveys were considered from a total of 41 doctors, 17 from the health center of Tahuantinsuyo Bajo and 10 from the Juan Pablo II health center. In both, 81.5% (n = 22) of the doctors had 7 years or more practicing as a doctor; there was only one resident doctor at the Tahuantinsuyo Bajo health center. In both establishments, the work was distributed as follows: Medicine, Surgery, Pediatrics, Gynecology / Obstetrics and Emergency; of which, 63% (n = 17) worked in the area of Medicine, 29.6% (n = 8) in Emergency, 25.9% (n = 7) in Pediatrics and 18.5% (n = 5) in Gynecology / Obstetrics. It should be noted that several doctors worked in different specialties at the same time, in both health centers.

#### Discussion

In the present study it was found that almost two thirds of the population of users of the health services, received antibiotics in the last year; within the most frequent consumption included respiratory infections and urinary infections and this is correlated with other studies (8,9), therefore it is observed that the reasons are common for antibiotic use in the community.

Regarding the knowledge of the population, it was obtained that 44.6% indicated that "it serves to kill bacteria", while in a qualitative study carried out in Asunción-Paraguay, it was found that two thirds of the respondents answered that the Antibiotics "cut the infection quickly." (10)

Another approach to this topic, is investigating the degree of knowledge of the patients who received a prescription for a treatment with antibiotics, which was studied in Murcia-Spain, where found that about half did not have sufficient knowledge about it (11). By Consequently, adequate use of the prescribed antibiotic cannot be ensured and this entails at increased risk for improper use of this.

On the other hand, when inquiring about obtaining antibiotics, in the present study, found that more than three-quarters of the population of health users had received the prescription from a doctor. However, about 20% purchased the drugs from the dispenser of the pharmacy, this is contrasted with a study carried out in Nuevo Chimbote Ancash where it was observed that more

than two thirds of the population obtained said medicines in the same way, because the pharmacies were close to the respondents and because on several occasions, a prescription was not needed (12).

It fits highlight that antibiotics are included within the group of drugs that should be dispensed with a prescription, as stipulated in the regulations for the use rational of drugs, at the national level (13); therefore it is observed that said regulations are not followed in different parts of our country. However, regarding self-prescription, it was observed that, in this study, a percentage small of the population (2.65%) engaged in this practice. This is correlated with a study carried out in Pueblo Libre-Lima, which inquired about the frequency of self-medication and it was found that 4.35% of the population self-medicated with antibiotics. (14). This practice does not represent a very significant percentage compared to the obtaining antibiotics by medical prescription or on the recommendation of the dispenser the pharmacy.

In addition, the practices of the users of health services were evaluated, regarding the use of antibiotics, through two cases that represent common health problems in primary care: an upper respiratory tract infection and an infection gastrointestinal. The population was evaluated regarding antibiotic treatment to the two situations raised and it was obtained that for the first case a third of the population replied that if necessary; This is correlated with studies carried out in Penang Malaysia and Lithuania (15,16), which through surveys investigated which were the

reasons for receiving antibiotic treatment, and it was found that in the first study almost half of the respondents considered the use of antibiotics necessary for symptoms of upper respiratory tract; while in the second study it was found that less than a quarter of the population of respondents indicated that these drugs were required to treat such symptoms. This denotes a contrast in terms of observed practices, of the use of antibiotics, in different parts of the world.

As for the doctors, the majority stated that the inappropriate use of antibiotics is a public health problem worldwide and that involves their daily practice, this is it correlates with what was found in other studies (17-20). Therefore, the global strategy for containment of antimicrobial resistance, carried out by the WHO (21), details that it is necessary to improve the use of these drugs by monitoring and dissemination of clinical practice guidelines.

Additionally, more than two thirds of those surveyed considered that there was a overuse of antibiotics in both health centers and at the national level, this is it correlates with a study carried out in Ireland (22), where it was found that there was an excess in the prescription of antibiotics, especially for the treatment of respiratory symptoms.

It is observed that the appearance of respiratory symptoms is one of the reasons for the overuse of antibiotics, for doctors and users of health services. The knowledge of physicians was investigated through two clinical cases, which described common health problems in the community; and it was observed that almost a third of the respondents incorrectly considered the use of antibiotics for both cases.

#### **Limitations**

One of the limitations of the study is the information bias, since the data collected could be incomplete or untrue, especially with regard to the knowledge about antibiotics and their use. Another important aspect is memory bias, due to wondering about past events, such as the last time who received these drugs and the reason for it, which may not be remembered when detail by respondents. Additionally, it should be noted that you cannot establish a real association between the variables studied, since the present study has a descriptive cross section.

#### **Conclusions and recommendations**

It is concluded that only about 50% of the population recognized that antibiotics serve to treat bacterial infections, therefore there is insufficient knowledge regarding the proper use of antibiotics and therefore it is necessary to educate the community studied.

On the other hand, two thirds of health users received antibiotics in the last year, three-quarters were prescribed by a doctor, 18% by the pharmacy clerk and only about 2% by self-prescription; however, it is required to comply with the regulations in

Regarding the obtaining of these drugs by the users of the services of health and pharmacy vendors. It was also observed that three quarters of the population would go to the doctor for upper respiratory symptoms, which denotes that the The population considers this reason for requesting medical attention and it is reflected in their attitudes towards the cases raised in the survey.

Regarding the doctors, it was found that almost all prescribed antibiotics more than once per day, and that they agreed that antimicrobial resistance is a health problem national and global level that involves their daily practice, in their health center. Finally, they suggested carrying out educational programs for adequate instruction in the prescription of antibiotics, this would improve the quality of the prescription, and therefore consequently intervene in the reduction of antimicrobial resistance.

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