Indiscriminate use of antibiotics: Measures and strategies

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ABSTRACT

Antibiotic resistance is a significant public health problem resulting from inadequate information about the incorrect use of antibiotics and patient pressure for prescriptions. These factors contribute to indiscriminate use, which poses a risk to public health. The study focused on the Basic Health Unit (BHU) in the municipality of Missão Velha, Ceará, with the primary objective of developing educational strategies, including pamphlets and infographics, to combat this indiscriminate use. To collect quantitative data, an 8-question multiple-choice questionnaire was used to survey participants' habits and awareness of the use of these medications, along with the participant consent form. The analysis of the results indicates that the majority of people are aware of the risks and proper usage, with a smaller percentage having limited knowledge. This suggests that there is a need to continue education and awareness efforts to mitigate factors promoting the inappropriate use of antibiotics in the community.

Keywords: Health Unit, Antimicrobial, Conscious Education.

1 INTRODUCTION

While studying the bacteria Staphylococcus aureus, Alexander Fleming accidentally discovered the antibacterial properties of penicillin. This discovery motivated the development of efficient antibiotics to treat a wide variety of bacterial diseases, responsible for serious infections in humans and mainly for soldiers' injuries during wars (Silva, 2023). These pharmacological agents have had a significant impact on the treatment of infections caused by bacteria, greatly reducing the health consequences associated with bacterial infections worldwide. However, it is important to highlight that the inappropriate use of these agents contributes to increasing the natural resistance of bacteria to antibiotics (Caldas; Oliveira; Silva, 2021).

Resistance is caused by changes in bacterial genetic material that occur during reproduction and lead to errors in the replication of the base segments that make up chromosomal DNA. These segments constitute the genetic code that determines the characteristics of bacteria. Additionally,

antibiotic resistance can be spread among bacteria through mechanisms of transduction, transformation, and bacterial conjugation that extensively utilize transposed genes and plasmid-based elements (Teixeira; Figueiredo; França, 2019).

Self-medication is a dangerous practice where individuals take "precautionary" measures on their initiative or based on poorly informed advice. Using prescription medications without proper guidance can lead to undesirable side effects and is a risky practice, especially for those with a history of diseases or allergies, due to a lack of awareness of the consequences (Oliveira, 2022). Therefore, it is the responsibility of prescribers who are committed to prescribing antibiotics and other medications to patients. These professionals are critical in ensuring the appropriate use of antibacterials and adopting appropriate and safe measures to treat patients effectively, considering the concern for antimicrobial resistance (Barbosa, et al., 2020).

The prolonged use of antibiotics highlights the importance of consumers being aware of the effects and potential side effects that these medications can have on the human body. The emphasis is on the need for health education as a critical tool to address this issue (Brito, 2019). Concerns have been raised regarding the significant increase in irrational antibiotic use in Brazil and worldwide. Given the immense importance of sustaining public health on a global scale, it underscores the urgent need to take measures that can restrict the spread of this issue at all levels of society (Müller, et al. 2022).

The process of health education is intricate and diverse, offering financial aid to empower patients to take charge of their education (Brito, 2019). Efforts involving sizable groups of individuals, such as awareness campaigns, community education programs, or joint endeavors between healthcare professionals and the community, are essential. These endeavors strive to spread pertinent information about the responsible use of medications and foster a more comprehensive comprehension of the various factors involved (Silva, 2021).

According to the World Health Organization (WHO, 2020), antibiotic resistance poses a risk as significant as a pandemic, with the potential to compromise medical progress. This highlights the need to implement strategies to address this issue, prevent its spread, and preserve the effectiveness of antibiotics to safeguard public health. Experts caution that over 20 million people die each year in Brazil due to bacterial diseases. Recent studies indicate that these infections could surpass cancer and diabetes, leading to a substantial increase in global mortality by 2050 (Vasconcelos; Campos; Cartágenes, 2022).

Awareness of the rational use of antibiotics can significantly reduce indiscriminate use, decrease bacterial resistance, and mitigate public health risks. This research aims to develop educational strategies that promote proper antibiotic use, effectively contributing to more responsible practices and preserving the medication's effectiveness for societal health benefits.

2 METHODOLOGY

2.1 LITERATURE REVIEW

The literature search was conducted using articles indexed between 2019 and 2023. A bibliographic search was performed by analyzing articles indexed in international virtual libraries, such as Pubmed (US National Library of Medicine National Institute of Health), Scielo (Scientific Electronic Library Online), and Google Scholar. The search was based on the following descriptors: bacterial resistance, mechanisms of microbial resistance, antibiotics, and bacteria (Dalmolin et al., 2022).

2.2 RESEARCH LOCATION

The study focused on analyzing the indiscriminate use of antibiotics at the Basic Health Unit (UBS) in the municipality of Missão Velha, Ceará. Address: 161 R. Padre Cícero, 64, Centro, Missão Velha - CE, 63200-000.

2.3 TARGET AUDIENCE

Fifty adults of both genders who visited the Basic Health Unit participated in the study. However, some individuals were excluded from the sample, such as those who declined to participate voluntarily, those who did not fully respond to the instrument used, and those who had visited the health unit within 2 months before the established deadline for data collection in the designated area (Silva; Santos, 2019).

2.4 RESEARCH CLASSIFICATION

The research is quantitative, assuming that everything can be measured or quantified. This method converts information and opinions into numbers to be classified and objectively analyzed. It involves the use of statistical tools and techniques such as percentages, averages, modes, medians, standard deviation, correlation coefficient, and regression analysis (Silva; Santos, 2019).

2.5 ETHICAL PROCEDURES

At the Basic Health Unit (UBS), participants were initially identified. They were then given the opportunity to provide informed consent by signing the Informed Consent Form (ICF). Subsequently, the data collection instrument was utilized to gather the required information for the study following the acquisition of consent (Silva; Santos, 2019).

2.6 MATERIAL

The researchers used pamphlets and infographics as the material for their study. The pamphlets were distributed to individuals, and the infographic was displayed on the wall of the UBS for easy visibility. Additionally, a self-designed multiple-choice questionnaire was used as a research tool.

2.7 DATA COLLECTION

The researchers processed and analyzed the data using Excel software, with a spreadsheet utilized for calculations and determining percentages based on the questions addressed in the questionnaire. The results were visually presented through graphs and tables to facilitate understanding and interpretation of the data (Rodriguez; Lima; Siqueira, 2020).

3 RESULTS

The research aimed to gather data from a target audience consisting of adults. A total of fifty individuals were interviewed. Presented below are three graphs that illustrate the survey results obtained from the interviewees.

Figure 1 displays data obtained from a survey that utilized a multiple-choice questionnaire with options for "yes" and "no" responses. The questionnaire focused on the use of antibiotics, habits, and awareness.

Figure 1: Participants' responses to questions 1, 4, 5, 6, 7, and 8 of the multiple-choice survey with yes or no options.

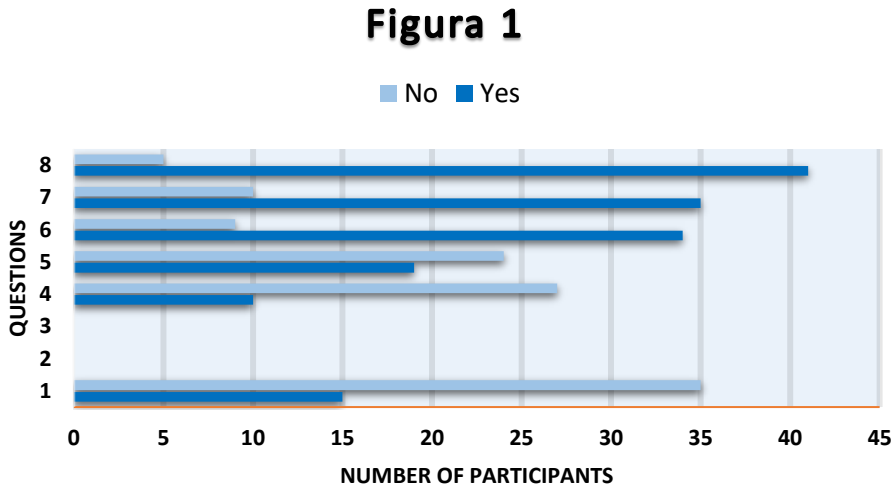


Figure 2 presents information from the second question of the survey. Fifty adults from the target audience were interviewed, responding to the multiple-choice question with options: regularly, occasionally, and never.

Figure 2: Participants' responses to the question 2: How often do you take antibiotics on your own?

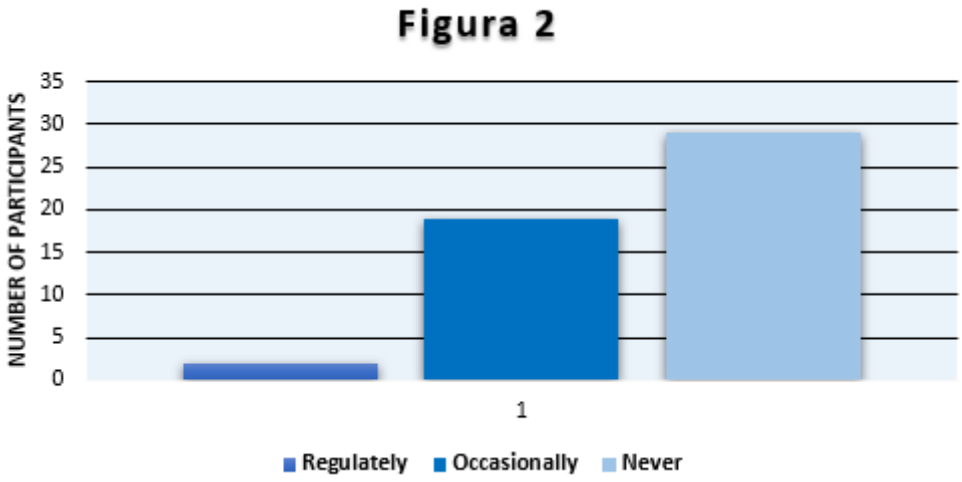
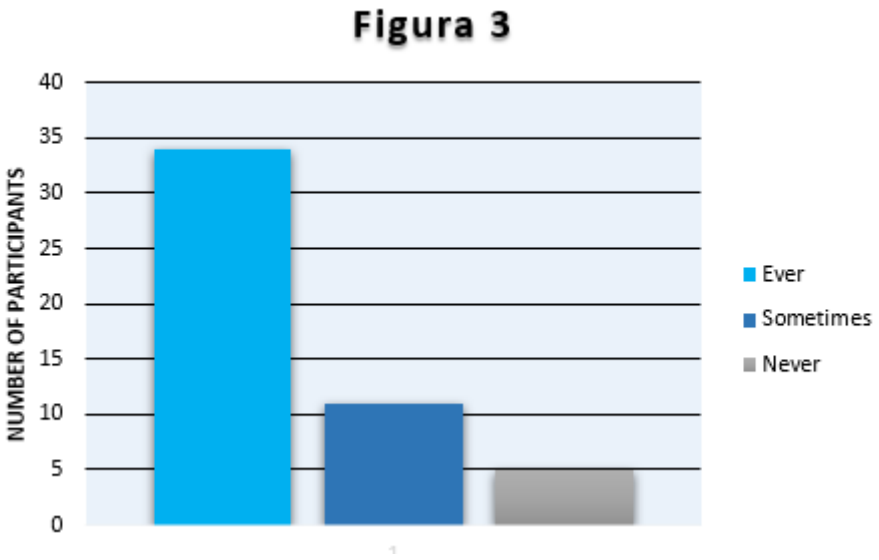


Figure 3 presents information from the third question of the survey. The multiple-choice question included options: Always, Sometimes, and Never. Fifty adults from the target audience were interviewed.

Figure 3: Participants' responses to question 3: Do you typically finish the entire course of antibiotics prescribed by the doctor, even if your symptoms improved before? Options: Always, Sometimes, and Never.



Question 1: The initial question reveals that 30% of respondents report using antibiotics, while 70% do not. This finding is significant because it indicates that the majority of adults interviewed do not regularly use antibiotics. This awareness is positive, as the indiscriminate use of antibiotics can lead to the development of bacterial resistance. Most of the interviewed individuals demonstrate a responsible attitude towards antibiotic use, which is an encouraging sign.

Question 2: In this question, the frequency of antibiotic use is investigated. Only 4% of respondents claim to use them regularly, while 38% say they use them occasionally, and 58% never

use them. This shows that the majority of adults interviewed resort to antibiotic use only when necessary, which is a prudent behavior. Frequent use of antibiotics can be harmful due to the risks of bacterial resistance, and most respondents seem to be aware of this.

Question 3: Here, the extent to which respondents follow medical prescriptions regarding antibiotic use is assessed. It is noted that 68% claim to always follow the medical prescription, 22% say they do it sometimes, and 10% never follow medical instructions. This suggests generally responsible behavior regarding antibiotic use, as the majority follow medical guidance. However, the existence of a group that does not follow prescriptions is a concern, as it may contribute to the development of bacterial resistance.

Question 4: Only 20% of respondents claim to use antibiotics, while 80% do not. This indicates that a relatively small portion of the interviewed population uses these medications. However, it is important to consider that the proportion of people using antibiotics may vary depending on the context and need.

Question 5: Here, 38% of respondents claim to have purchased antibiotics without a prescription online or from pharmacies, while 62% do not. This creates a significant variation compared to Question 1, where the majority of respondents stated not using antibiotics. This inconsistency in responses may be due to different interpretations. Despite the lower percentage saying yes, the majority saying no is a positive result.

Question 6: In this question, 68% of respondents claim that antibiotics are effective against viral infections, while 32% do not. This response shows a different trend compared to previous answers and suggests that a considerable portion of respondents use antibiotics despite the variation in responses.

Question 7: In the seventh question, 70% of respondents claim to have received enough information from healthcare professionals, while 30% do not. This question reflects a behavior similar to Question 6, where the majority of respondents stated that antibiotics are used for viruses and flu.

Question 8: In the last question, 82% of respondents claim to be aware of the risks associated with the inappropriate use of antibiotics, while 18% say they are not aware. A favorable result.

4 DISCUSSION

This study aimed to investigate the knowledge, practices, and habits of the general population regarding the use of antibiotics. The results of the present research provide an updated insight that will aid in the conception of the prudent use of antibiotics.

According to Pelicioli et al (2021), the prudent use of medications is a collective effort involving various sectors of society. The government, legislators, public policymakers, the

pharmaceutical industry, patients, and healthcare professionals collaborate to ensure the prudent use of medications.

In this context, pharmacists play an essential role, as stated by Oliveira (2021). Due to their proximity to patients, they can actively support health education, including teaching people how to take antibiotics responsibly and appropriately. As a result, pharmacists play a significant role in combating antimicrobial resistance, a major problem caused by the improper use of these medications.

According to Souza et al (2021), the excessive and improper use of antibiotics can lead to the emergence of microorganisms resistant to these drugs. Essentially, this means that common infections become more challenging to cure as medications lose their effectiveness. Therefore, to prevent microorganisms from developing resistance, antibiotics must be used with prudence and care.

According to Dias (2021), an effective way to combat the irrational use of antibiotics is through health education. This involves sharing relevant information with the public to increase awareness about the use of antibiotic protectors and the ability to play a crucial role in disseminating educational information about antibiotics to patients. According to research by Oliveira (2021), a study conducted in a basic health unit in São Paulo examined the prescription and use of antibiotics. Two years of the study were dedicated to antibiotic distribution with the assistance of a healthcare specialist. The first year of the trial involved standard techniques, while the second year introduced new software and protocols. The results showed that the implementation of the program and seeking professional assistance resulted in a more prudent and effective use of antibiotics.

According to Dias (2021), there are two issues related to the use of antibiotics. Firstly, some patients discontinue treatment as soon as they start feeling better instead of completing the entire course. Additionally, some individuals resort to self-medication with antibiotics when they experience similar symptoms in a new clinical scenario.

For Souza et al (2021), the premature interruption of treatment is directly linked to a lack of adherence to antibiotic prescriptions, which can result in the recurrence of the infection, complicating treatment and contributing to the development of bacterial resistance. Furthermore, according to Dias (2021), occasional antibiotic use can be caused by various factors, such as difficulty in distinguishing the correct etiology of the infection, belief in the prophylactic use of antibiotics for the prevention of complications, and, in many cases, family pressure for their prescription.

As mentioned by Reis et al. (2023), when individuals perceive that their symptoms are not severe enough to warrant a visit to the doctor, many turn to self-medication. Instead of seeking cures, they opt for palliative measures to alleviate discomfort caused by issues such as sore throats or toothaches. To support the claim that self-medication is a common practice, the author cites Sachdev et al. (2022), highlighting that a significant factor promoting self-medication is the difficulty in

accessing basic medical treatment. Thus, the practice of self-medication strengthens when people resort to it as a last resort to relieve symptoms when they cannot access basic medical care.

The extent to which a patient adheres to the prescribed treatment plan is referred to as adherence. It is imperative that patients precisely follow their prescriptions to avoid medication-related problems or the worsening of their conditions. This is a critical component for achieving the intended clinical outcomes (Pelicioli, 2019). Furthermore, it is essential to recognize the need for a more involved Hospital Infection Control Committee (CCIH) in the medical environment. Instructing members of the multidisciplinary team on the value of adherence to clinical guidelines established by healthcare units is a proactive duty that this committee should undertake. By doing so, the CCIH helps improve patient safety standards (Soares, 2023).

5 CONCLUSION

The research findings show that while adults in Missão Velha, Ceará, are generally aware of the risks of improper antibiotic use, there are still challenges to address. The fact that a significant portion of the population has self-administered antibiotics and not completed the prescribed therapy is concerning. It is crucial to prioritize antimicrobial awareness and education. Targeted campaigns are necessary to emphasize the importance of following medical recommendations and the risks of misuse, in order to ensure the effective use of these medications and reduce the potential for bacterial resistance. The study highlights the ongoing need for education and guidance to promote responsible antibiotic use and maintain their long-term efficacy in combating bacterial infections.

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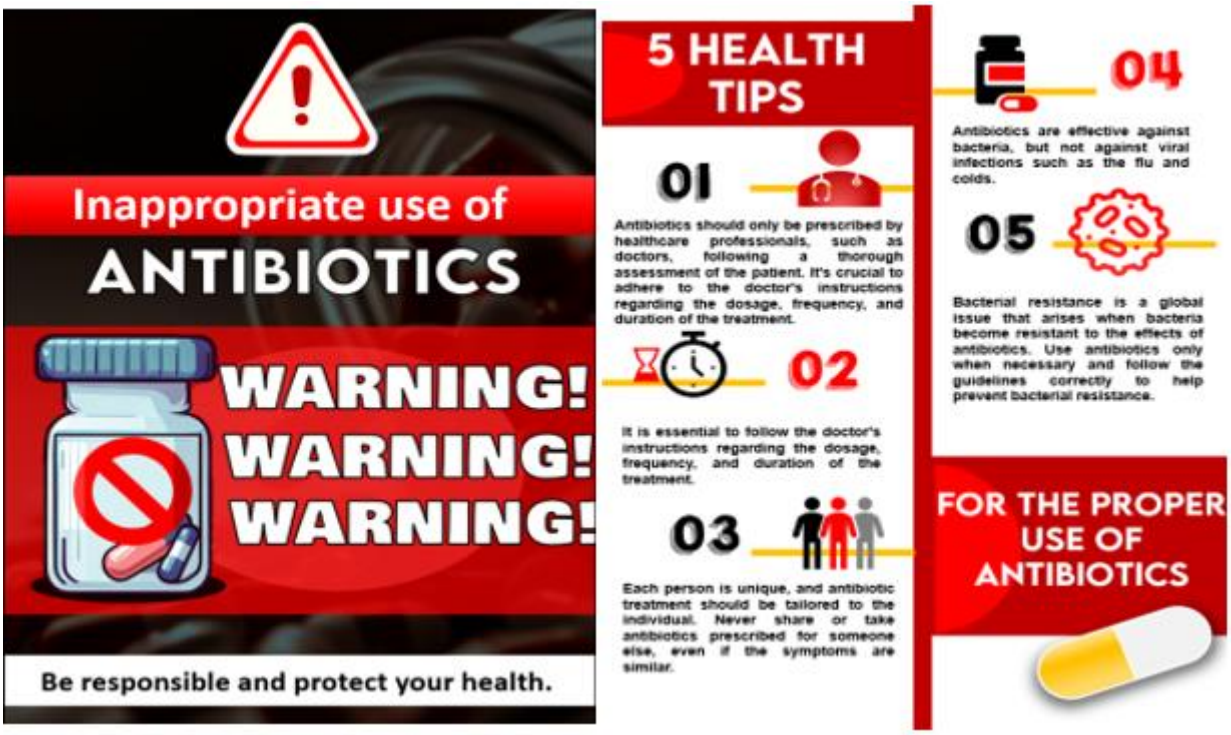
APPENDICES



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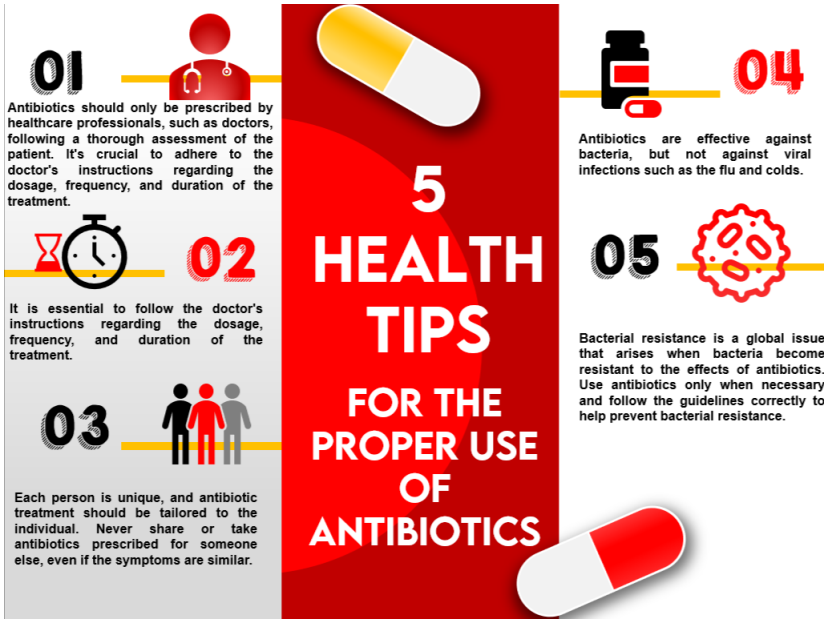

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DISTRIBUTION

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INTERVIEWS

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QUESTIONNAIRE

1 Have you taken antibiotics without a prescription in the last year?

o Yes

o No

2 How often do you take antibiotics on your own?

o Regularly

o Occasionally

o Never

3 Do you usually complete the full course of antibiotics prescribed by the doctor, even if your symptoms improve before?

o Always

o Sometimes

o Never

4 Do you share prescribed antibiotics with others, such as friends or family?

o Yes

o No

5 Have you ever bought antibiotics without a prescription online or from pharmacies that do not require a prescription?

o Yes

o No

6 Do you believe antibiotics are effective against viral infections, such as colds and flu?

o Yes

o No

7 Have you received enough information from healthcare professionals about the proper use of antibiotics?

o Yes

o No

8 Are you aware of the risks associated with the improper use of antibiotics, such as bacterial resistance?

o Yes

o No