Evaluation of Antibiotics Self-Medication in Rwandan University Students

Mugabo C[1,2]*

[1]University of Rwanda, Rwanda

[2]Department of Pharmacy, Daffodil International University, Bangladesh

*Corresponding author: Christian Mugabo, University of Rwanda, College of medicine and Health Sciences, Daffodil International University, Department of Pharmacy, Bangladesh, Email: chrismug10@gmail.com

Abstract

Background: Self -medication with antibiotics is quite high in developing countries as opposed to developed countries. Antibiotics are often taken erroneously for certain ailments, without having the appropriate knowledge of their use. This carries potential risks for the individual as well as the community such as antibiotic resistance. This study concerned the self-medication with antibiotics in the university of Rwanda non-medical students, CST, Nyarugenge Campus. The main objective of this study was to assess the self-medication with antibiotics and the specific objectives were to assess the prevalence of self-medication with antibiotics, to identify the common types of perceived illness/symptoms that necessitate self-medication with antibiotics, to determine major antibiotics used for self-medication and to find out the reasons for self-medication with antibiotics among the University of Rwanda non-medical students, CST, Nyarugenge Campus.

Methodology: A descriptive cross-sectional study was carried out at University of Rwanda non-medical students, College of Science and Technology, Nyarugenge campus (UR/CST). 386 students were included in the study. Data were collected using questionnaires and analyzed accordingly.

Results: the prevalence of self-medication with antibiotics in this study was 20.2%. The average number of times of SMA was 2.5. Reasons for self-medication were, disease was not serious 52.56%, successful previous experience 16.66%, no money/ time for hospital bill with 14.1%, discomforting attitude of the health care providers/ no confidence in doctor with 10.25%, and frustrated with tiring protocol with 3.84%. Most used antibiotics were, Amoxicillin 55.12%, ciprofloxacin with 14.10%, cloxacillin 11.53%, tetracycline 8.97%, metronidazole 2.56%, and co-trimoxazole 1.28%. Common illnesses and/or symptoms treated with antibiotics were, Cough at 47.43%, cold at 23.07%, diarrhea at 14.1%, Fever at 10.25%, and Headache at 2.5%.

Conclusion: The prevalence of self-medication with antibiotics is high among University of Rwanda non-medical students. There is an urgent need to educate students on the rational use of antibiotics and enforce implementation of laws restricting access to antibiotics in Rwanda.

Keywords: Self-Medication; Antibiotics; Non-Medical Students

Abbreviations: OTC: Over the Counter; POM: Prescription only Medications; CD-POM: Controlled Drug Prescription only Medicines; WHO: World Health Organization; CST: College of Science and Technology; SMA: Self-Medication with Antibiotics; UR: University of Rwanda.

Mugabo C. Evaluation of Antibiotics Self-Medication in Rwandan University Students. Health C Res Public Safety J 2022, 4(1): 180028.

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Introduction

Background

The antibiotics are one of the most commonly purchased drugs worldwide, especially in developing countries, where the prevalence of the infectious diseases increases their use [1]. They represent a large impact due to the costs they generate, the damage to health (adverse reactions and therapeutic failure), and poor therapeutic practices, such as long-term self-medication. These present a global public health problem. Self-medication is the use of medications to treat common health problems without being prescribed by a doctor [2]. However, self-medication in the case of the use of antibiotics has become a dangerous trend, which begins at an early age (adolescence). Studies reveal that this practice is facilitated by easy access to antibiotics, low knowledge about antibiotics, low income, the cost of medical consultation, and prior use of antibiotics, among others [3,4] On the other hand, self-medication with antibiotic (SMA) can alleviate some symptoms, which leads some to stop attending medical advice. However, it has been shown to have negative consequences, such as treatment failure and adverse drug effects (leading to death in the most severe cases), but mainly increased bacterial resistance [5].

Antimicrobial resistance is considered a global public health problem, and is caused by the indiscriminate use of antibiotics, as seen in SMA. This resistance may result in longer-lasting illnesses, more hospital stays, the need for more expensive and toxic medications, and even death. The prevalence of this activity is greater in developing countries, in most cases due to a lack of regulatory systems worldwide, and reports indicate that self-medication is more prevalent in cities of low and middle income. In addition, other factors have been identified in developing countries, such as foreknowledge of antibiotics, age, and monthly income, among others.

SMA rates are, on average, 50% in Africa, 40% in the Middle East, from 4% to 75% in Asia and 29% in South America, compared to developed countries in Europe, with an average of from 3 to 19%. Studies in China revealed rates of self-medication with antimicrobials from parents to their children to be 62% [6]. The abuse of antibiotics in undergraduates continues to be a significant problem in both developed and developing countries [7]. The liberal practice of undergraduates to self-medicate with antibiotics is common, and students base their use on previous successful experiences. However, we have identified that there is low awareness of antibiotic use and students often misuse them [8].

Many articles reported that common Over the Counter (OTC) and Prescription Only Medications (POM) have been associated with adverse health reactions or fatalities. In addition, self-medication can slip towards medication with POM and Controlled Drug Prescription Only Medicines (CD-POM). This inappropriate use may result in irrational medicine use, delayed seeking medical advice, increased side effects and drug interactions.

Problem Statement

Nowadays, antibiotic resistance is becoming an existing worldwide problem, mainly in developing countries [9]. Many international studies have investigated the prevalence and nature of self-medication practices at the population level. The university students are induced in the practice of self-medication due to their life conditions as some researches have shown. The life conditions of university students may make them practice self-medication as means to avoid missing their lectures or spend much on the health care delivery process like in Rwanda, some graduates also looked at the prevalence of self-medication with antibiotics among university students in general; however, the prevalence of antibiotic self-medication in non-medical field not been well described [10,11]. The main objective of this study will to assess the self-medication with antibiotics among the university non-medical students in attempt to inform future educational efforts on drug misconceptions in order to encourage safe medication practices among undergraduate non-medical students.

Objectives of the study

General Objective

The main objective of this study was to assess the self-medication with antibiotics among the university non-medical students.

Specific Objectives

- To assess the prevalence of self-medication with antibiotics among university non-medical students.
- To identify the common types of perceived illness/ symptoms that necessitates self-medication with antibiotics.
- To determine major antibiotics used for self-medication
- To find out the reasons for self-medication with antibiotics

Research Questions

- What is the prevalence of SMA among university non-medical students?
- What are common types of perceived illness /symptoms that necessitate SMA?
- What are major antibiotics used for self-medication?
- What are the reasons for SMA?

Hypothesis

There is self-medication among students of university of Rwanda

Benefits from the Study

This study assessed the self-medication with antibiotics among the university non-medical students in the UR/CST, NYARUGENGE Campus. This study can serve as information for creating the awareness strategies to the community concerning the self-medication with antibiotics, it will inform also policy makers about the new trends as a way forward for regulation of prescribing and dispensing patterns among healthcare providers, it will also awaken the knowledge of healthcare providers for safe handling and use of antibiotics. This study also will lay as a foundation for future researchers regarding this topic or different areas regarding this sector.

The study ascertained the most commonly used antibiotics on self-medication, the probable indications expected by the users and the frequent antibiotics in use. The study covered non-medical students in UR/CST, Nyarugenge campus whom we believe as less knowledge on rational medicine use population and the study lasts 1 Year.

Methodology

Study Design

The study was a descriptive study and it was consisted of a structured survey among the university non-medical students where a structured questionnaire consisting of close-ended and open-ended questions to the selected respondents was be used. Answers form the questionnaire was used as the data source and the results was statistically analysed using MS Excel 2013.

Site and Study Population

The site of this study was at the University of Rwanda, NYARUGENGE Campus, College of Science and Technology. This campus was selected because it is one of the colleges where many students don't have much information on antimicrobials since are not medical students and believe due to insufficient knowledge, they are exposed. Furthermore, it is located at the center of Kigali city where there is a very high accessibility to medicines especially those of antibiotics due to increased medical infrastructures including community pharmacies, clinics and also as the area of business that can trigger a student to access antibiotics easily. This Campus is located in the Kigali city and has a population of 3664 total registered students in the year 2017/2018.

Study Enrolment Criteria

- Participants Inclusion Criteria: This study included people who fulfill the following criteria: Being a registered undergraduate student in CST, having their classes in NYARUGENGE campus and having consented participate to this research project.
- Participants exclusion Criteria: This study didn't take into consideration: People who won't be registered UR/CST, not studying in NYARUGENGE campus and student who won't consent to participate in study.

Sampling Method and Sample Size

The sampling method was a simple random sampling method using Yamane formula showing that $n = N/[1+N(e)2]$, where 'n' is the sample size, 'N' is the number of population and 'e' is the error margin. Using 3664 students as N with the margin error 'e' of 0.05, the sample size is 361.

Data Collection Tool and Procedure

An approval for data collection was given by the principal of UR/CST. The questionnaires were issued to class representatives to help to contribute them to their students. The questionnaires returned to me immediately after students finished filling.

Data Entry and Data Analysis

The tool that was used for data analysis was the MS excel 2013. This software was used to make both the data entry and analysis in order to have a common data set for all the respondents. It was used also to have cross-tabulations, tables, pie-charts and other features for interpreting the results.

Ethical Considerations

After the approval of the research proposal from the UR/Pharmacy department, I applied for authorization from UR/CST through the principal for data collection and they responded to me with a written letter. The participants answered the questionnaires individually.

Results Interpretation and Discussion

Demographic Characteristics of the Respondents

In order to elicit key information the pharmacist should obtain relevant information about patient's demographics like sex, age, pregnancy, weight, allergies, etc. This will help making an informed decision to dispense an OTC or refer the patient to a doctor. This study also investigated various reasons that could be associated with SMA. No association could be established between the demographic factors such as gender and sex as other previous studies claimed [12]
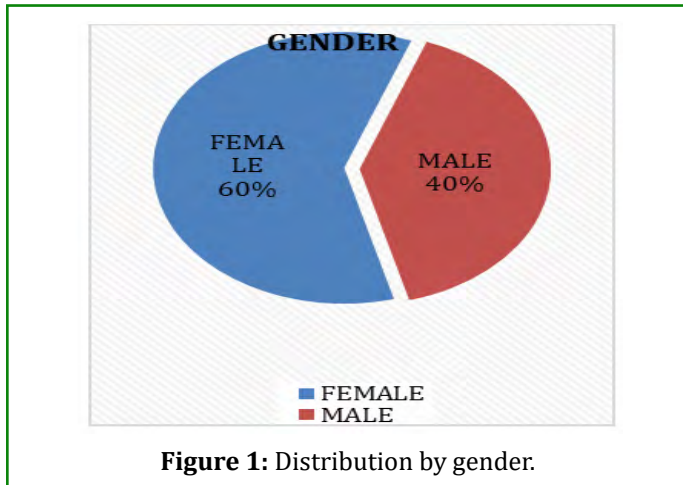
(Figure 1).

Figure 1: Distribution by gender.

Females and males 231 to 155 in numbers and their percentages were approximately 60% to 40% respectively (Figure 2).
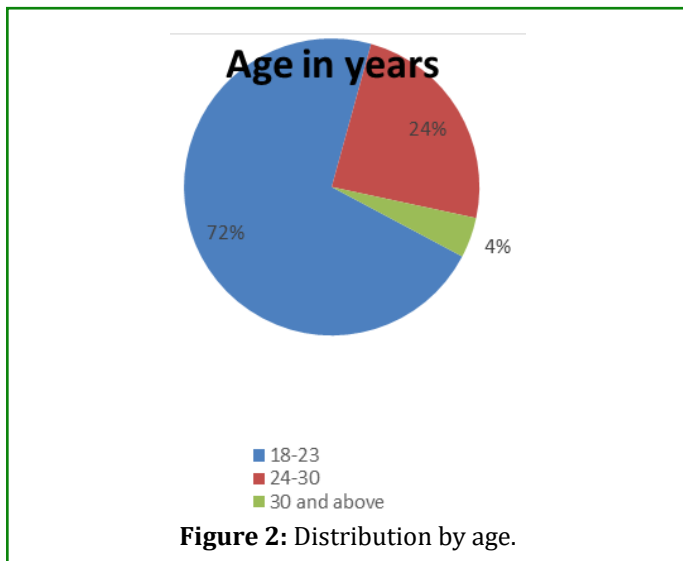

Figure 2: Distribution by age.

People between 18-23 years were 276 in numbers; 24-30 years were 93 in numbers and 30 years and above were 17 in numbers which makes approximately 72, 24 and 4 in percentages respectively.

Prevalence of Self-Medication with Antibiotics

- **Overall Self-Medication with Antibiotics:** The first objective of the study was to verify if respondents have ever been self –medicated themselves with antibiotics or not. According to my results 20.2% of respondents (78/386) were self-medicated with antibiotics, whereas 79.8% of respondents (308/570) were not. This prevalence of approximately 20% is a large number

which shows that self-medication with antibiotics was exercised among the university students in CST. As it becomes a big threat to health as the world is experiencing the effects of antimicrobial resistance, this is a large number compared to the previous study done in former UNR (University National du Rwanda) which claimed to be 12.4% [10].

- **Distribution of Self-Medication with Antibiotics by Gender:** The study was interested in knowing the proportion of self-medication of the respondents by gender. Results were, 20.3% of female respondents that correspond to 47 out of 231 were self-medicated with antibiotics whereas 79.6 % that correspond to 184 out of 231 of female respondents were not. On the other hand, 20% of male respondents that correspond to 31 out of 155 were self-medicated whereas 80% that correspond to 124 out of 155 of male respondents were not (Table 1).

GENDER	% (FREQUENCY)	
	Non self-medicated	**Self-medicated**
Females (N= 231)	79.6% (184)	20.3% (47)
Males (N=155)	80% (124)	20% (31)

Table 1: Distribution of self-medication with antibiotics by gender.

These results showed that SMA was more practiced in females than males however the relationship between gender and SMA was not assessed by this study, further research will be needed.

Number of Times for Self-Medication with Antibiotics

This study was interested also in knowing how many times the respondents have treated themselves with antibiotics during the whole year (Figure 3).
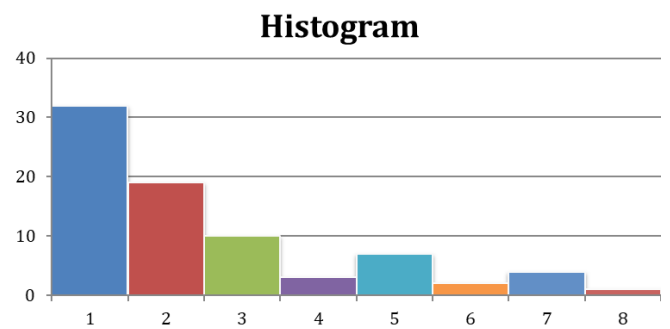

Figure 3: Number of times for SMA.

As illustrated in the above histogram, the majority of those who were self-medicated with antibiotics had done it mainly 1 and 2 times, then 3 and 5 times on a lower scale. The average number of times the self-medication occurred is 2.5. This number is a beat higher in a period of the year compared to the previous study done at UR which claimed 2 as the average [11].

Reasons for Self-Medication with Antibiotics

Regarding the reasons for SMA, different reasons were provided by respondents. Results are shown in the following Table 2, where the greatest proportion of students practiced SMA because they thought the disease was not serious with 52.56%, 41/78, followed by successful previous experience with 16.66%, 13/78, No money/time for Hospital Bill with 14.1%, 11/ 78, Discomforting attitude of the health care providers/ No confidence in Doctor with 10.25%, 8/78 and frustrated with tiring protocol with 3.84%, 3/78.

Reason for SMA	Percentage (Frequency)
Disease was not serious	52.56% (41)
Successful previous experience	16.66% (13)
No money/time for Hospital Bill	14.1% (11)
Discomforting attitude of the health care providers/ No confidence in Doctor	10.25% (8)
Frustrated with tiring protocol	3.84% (3)
Others	2.56% (2)

Table 2: Reasons for self-medication with antibiotics.

This main reason of SMA showed that students might think illness to be not serious while it is. This may be related to the lack knowledge about health concerns particularly the rational use of antibiotics. The other wild thing is when you find a person experience some of the previous symptoms and treat them with the same antibiotic while the disease might not need it.

The results in table 2 are in line with another research conducted in the university students of Karachi and in UR [10], where it is said that the main reason is "illness not serious" and other shown reasons in this study. Similar reasons were also frequently reported in SMA in other studies, where previous experience with similar symptoms and mildness of the illness were the reason for SMA [6,13].

Long waiting time at the overburdened health facilities and mildness of disease were also among the two major reasons reported in the study conducted in the Community of Silte

Zone, South Ethiopia [14]. Several studies revealed that the increase in SMA in developing countries was due to a number reasons. These included the cost of medical consultation, low satisfaction with medical practitioners, and misconceptions regarding the efficacy of antibiotics [3,15].

Main Antibiotics Used in Self-Medication with Antibiotics

This study wanted to investigate the main antibiotics used by the respondents while doing self-medication [16]. As the results in Table 3 show, the main antibiotics used is Amoxicillin at 55.12%, (43/78), ciprofloxacin with 14.10%, (11/78), cloxacillin with 11.53%, (9/78), tetracycline 8.97%, (7/78), metronidazole with 2.56%, (2/78) and Bactrim with 1.28%, (1/78).

Name of Antibiotics	Percentage (Frequency)
amoxicillin	55.12% (43)
Ciprofloxacin	14.10% (11)
Cloxacillin	11.53% (9)
Tetracycline	8.97% (7)
Metronidazole	2.56% (2)
Cotrimoxazole (Bactrim)	1.28% (1)
Others	6.41% (5)

Table 3: Main antibiotics used while doing SMA.

The reasons of choosing Amoxicillin as antibiotics in SMA was not identified by this study but upon trying to ask, they showed that it is cheap compared to other antibiotics, widely known and according to the previous experience with themselves or their friends [17,18]. The other antibiotics that was not mentioned and people took includes cefadroxil, chroramphenicol and penicillin. These results are in accordance with the study done in North West Ethiopia in Addis Ababa University, in 2014 where amoxicillin was main antibiotic among other antibiotics. Similar results were also reported by other studies done in some developing countries where amoxicillin have been widely used for self-medication [6,3,14].

Illnesses and/or Symptoms Treated with Antibiotics

This study was also interested to know the illnesses and/ or symptoms that involved self-medication with antibiotics among university non-medical students of UR/CST. As the results show in Table 4, common illnesses or symptoms were cough at 47.43%, (37/78), cold at 23.07%, that correspond to (18/78), diarrhea at 14.1%, that correspond to (11 /78), Fever at 10.25%, that correspond to (8 /78) and Headache at 2.5%, and others like flu [19].

Illness and/or symptom	Percentage (Frequency)
Cough	55.12% (37)
Cold	14.10% (18)
Diarrhea	11.53% (11)
Fever	8.97% (8)
Headache	2.56% (2)
Others	6.41% (2)

Table 4: Illnesses and/or symptoms treated with antibiotics.

The results in table 4 were relevant according to the founding of another study done on self-medication with antibiotics among the university students of in southwestern Nigeria where the main illness or symptoms were that came from respiratory airways [9]. Moreover this study showed that they were not treated using SMA.

Conclusion

Self-medication with antibiotics exists and the prevalence self-medication with antibiotics was approximately 20%. The females practiced self–medication with antibiotics more than the males, worth of 60.25%. The self-medication has been observed in many cases of cough followed by cold and diarrhea and claimed percentages were 47.43%, 23.07%, 14.1% respectively and Amoxicillin was the most self-medicated antibiotic followed by ciprofloxacin and cloxacillin with 55.12%, 14.10%, 11.53% respectively.

The reasons for self-medication are also increasing day by day starting from increasing education level, increasing awareness to busier life styles of students where they mostly thought disease was not serious followed by successful previous experience and the lack of means for medical consultation by 52.5%, 16.6%, and 14.1% respectively [20-23]. In summation, the findings of this survey provide the first data to throw light on the phenomenon of self-medication with antibiotics among students of UR/CST. This type of practice could be expanded among other university non-medical students like UR/college of education, college of arts, media and social sciences, and college of business.

In conclusion, although appropriate self-medication can be advantageous without proper education of the public and proper regulation of potent drugs dispensary, it may cause tragic consequences. Thus, public education regarding the dangers of self-medication must also be given due attention. This study has shown that irrational use of antibiotics through self- medication appears to be a common practice among University non-medical students. This finding provides vivid evidence about the abuse of antibiotics these students and explains the escalating trend of antibiotic resistance in the country in future [24,25].

Recommendations

The high prevalence of self-medication with antibiotics among university non-medical students underscores the role of the primary care physician, pharmacist in advising students about the correct use of the antibiotics. Another important intervention to stem the tide of self-medication with antibiotics is effective legislation banning unregulated sale of antibiotics without medical prescription. Efforts should be made by appropriate health organizations to conduct annual antibiotic awareness campaign emphasizing the importance of using antibiotics responsibly. By targeting university students especially those who aren't enrolled in medical fields. Future research should include other university non-medical students to determine the overall prevalence of self-medication with antibiotics.

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