# FACTORS AFFECTING PREVALENCE OF SELF MEDICATION OF ANTIBIOTICS AMONG ADULT POPULATION IN ISHAKA-BUSHENYI MUNICIPALITY

**BY**

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**A RESEARCH DISSERTATION SUBMITTED TO THE SCHOOL OF PHARMACY IN PARTAL FULFILLMENT OF THE REQUIREMENTS FOR THE AWARD OF DEGREE OF BACHERLOR OF PHARMACY OF KAMPALA INTERNATIONAL UNIVERSITY UGANDA**

## DECLARATION

I hereby declare that this research dissertation has not been submitted in full or part to any other institution for any purpose and that the views expressed here are mine unless otherwise stated and where such is the case, acknowledgement or reference is made.

SIGNATURE: ..... DATE...../...../.....

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## APPROVAL

This research dissertation has been submitted to School of Pharmacy with my consent and approval as the student's supervisor

SIGNTURE:..... DATE 19/12/2018.

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## DEDICATION

I dedicate this research dissertation to my beloved mum, (Mrs. Musenero Racheal), dad Mr. (Waiswa Wilber) and all my brothers, sisters, friends, including my research supervisor Pharm. Amamchukwu Ambrose Akunne for the time and guidance he has given towards the success of this research.

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## ABSTRACT

**Introduction:** The research deals with the factors affecting the prevalence of self-medication of antibiotics among adult population in Ishaka-Bushenyi Municipality. It was guided by the following objectives: to determine the prevalence of self-medication of antibiotics and other miscellaneous issues among the adult population in Ishaka-Bushenyi Municipality, to establish the socio-demographic characteristics of adult population engaged in self - medication of antibiotics in Ishaka-Bushenyi Municipality, and to establish the factors affecting self-medication of antibiotics among adult population in Ishaka-Bushenyi Municipality.

**Methodology**: This was a cross-sectional study conducted in Ishaka-Bushenyi Municipality from April 2018 to December, 2018. A pretested self-administered questionnaire was used to select 384 participants residing in the area, who reported to have felt sick in the last period of one year using simple random sampling method. The data obtained were entered into Microsoft Office Excel 2010 and imported into STATA 13 for analysis. Both univariate and multivariate logistic regression analysis were carried out together with descriptive summary statistics using STATA 13.

**Results:** The prevalence of self-medication of antibiotics was high at (78.13%). Friends (30.60%) and previous prescription (28.83%) were the source of information for the self-medication that was mostly reported. The most common indications that made respondents to use antibiotics were cough, cold and sore throat (31.67%) followed by headache, fever and malaria (23.13%). Metronidazole (19.57%), Amoxicillin (12.81%), Doxycline (12.10%), Ciprofloxacin (11.03%) and Septrin (11.03%) were the most self-medicated antibiotics. Quick relief (27.76%) and no need to visit a doctor for minor illness (26.33%) were the main reasons in favour of this practice.

In the univariate analysis with respect to the relationship between self-medication and socio-demographics, only age (P=<0.0001), place of residence (P=0.0103), marital status (P=0.0016), educational level (P=0.0001) and occupation of participants (P=<0.0001) were statistically related to self-medication, and the likelihood of self-medication was statistically higher among those with tertiary education [COR=26.62, P=0.002, 95%CI (3.406- 240.5)], secondary education [COR=20.30, P=0.006, 95%CI (2.398- 171.9)] and primary education [COR=11.81, P=0.024, 95%CI (1.389- 100.4)] respectively than reference group without formal education [COR=1] as well as among the students [COR=6.937, P= <0.0001, 95%CI

(3.150 to 15.28)] and those with modern occupation [COR=2.417, P= 0.001, 95%CI(1.435 to 4.071)], than the reference group on traditional occupation [COR=1]. Similarly, in the multivariate analysis, all the variables including age, sex, residence, marital status, educational level, occupation, religion, and monthly income were statistically related to self-medication (P=<0.0001) respectively. The likelihood of self-medication was however, statistically higher among the age group age 25-29 years [AOR=2.316, P=0.042, 95%CI (1.031 to 5.202)] than the reference age 18-24 years [AOR=1], those with secondary education [AOR=9.20, P=0.041,95%CI (1.098 to 87.81)] than the reference group who had no formal education [AOR=1], and the students and apprentice [AOR=5.026, P=<0001, 95% CI (2.124 to 11.89)] than the reference group in the traditional occupation [AOR=1] respectively.

In the context of factors affecting self-medication in the univariate level, long distance to the health facility (P=<0.0001), lack of access to healthcare facility (P=<0.0001), non-affordability of healthcare services (P=0.003), non-availability of healthcare facility (P=0.0002), lack of drugs in healthcare facility (HCF) (P=0.002), lack of healthcare workers (HCWs) in HCF (P=0.014), lack of health insurance policy among the participants (P=0.004), and lack of enforcement of antibiotic policies (P=0.001) respectively, significantly affected self-medication of antibiotics. In the multivariate analysis, long distance to the health care facility (HCF), lack of access to healthcare facility, non-affordability of healthcare services, non-availability of healthcare facility, lack of drugs in the healthcare facility, lack of HCWs, the attitude of the HCWs, lack of health insurance policy, and lack of enforcement of antibiotic policies statistically affected self-medication (P=<0.0001) respectively.

**Conclusion:** The prevalence of self-medication is high (73.18%). It is more prevalent in: younger population 25-30 years followed by 18-24 years than the old population, single participants than the married and divorced, educated than the non-educated, male than the female, those residing in the urban than the rural population and students than any other occupation. Metronidazole and amoxicillin were the most self-medicated antibiotics.

**Recommendations:**

Proper education on the dangers of self-medication without prescription through media and provision of affordable, available, accessible health care services together with provision of health insurance and introduction of strict antibiotic policies might help to reduce the practice.

# CHAPTER ONE

## 1.0 INTROUDCTION

### 1.1 BACKGROUND

Self-medication is the selection and use of medicines by individuals to treat self-recognised illnesses or symptoms. For the purposes of this definition, medicines also include herbal and traditional products; it is one of the elements of self-care. It can also be defined as the use of drugs to treat self-diagnosed disorders or symptoms, or the intermittent or continued use of prescribed drugs for chronic or recurrent disease or symptoms. It is done without prior medical consultation regarding indication, dosage, and duration of treatment (Uddin *et al.*, 2018).

Self-medication is also a human behaviour in which an individual uses a drug or any exogenous substance for physical or psychological ailments. Most widely self-medicated substances are the over –the –counter drugs used to treat common health issues at home. No need of doctors' prescription to obtain and are available in supermarkets and convenience stores in some countries (Sajith *et al.*, 2017).

Antibiotics are used for live saving of millions of people and are significant in the control of infectious diseases. However, the emergence of bacterial strains resistant to the available antibiotics is a major setback in achieving the require goal. Studies showed an increased bacterial resistance to the antibiotic for various reasons and the one of them is self-medication of antibiotics without a prescription which may result to over or under dosage, misdiagnosis and inappropriate indication (Mayoclinic, 2018).

The psychology of self-medicating with psychoactive drugs is typically within specific context of using recreational drugs, alcohol, comfort foods and other forms of behaviour to alleviate symptoms of mental distress, stress and anxiety, including mental illness and psychological trauma. Self-medication can be seen as gaining personal independence from established medicine norms, and may be seen as a human right, closely related to refusal-of professional medical treatment (Gupta, 2014).

Self-medication is highly regulated in much of the world and many classes of drugs are available for administration only upon prescription by licensed medical personnel. Safety, social order, commercialization, and religion have historically been among the prevailing factors that lead to such prohibition (Chen *et al.*, 2014).

### 1.1.1 SELF-MEDICATION HYPOTHESES

The self-medication hypothesis (SMH) states that the individual's choice of a particular drug is not accidental or coincidental but as a result of individual's psychological condition as the drug provides relief to the user specific condition. It initially focused on heroin, later added cocaine expanded to alcohol and finally all drugs of addiction (Connolly *et al.,* 2006).

#### 1.1.1.1 Khantizian's hypothesis

According to khantizian's self-medication hypothesis (2003), substance dependence is a compensatory means to modulate and self-soothe in response to distressing psychological states. He continued stating that the addicted and drug abusers compensate for deficient ego function by using drugs. According to him, the addicts choice of the drug is the interaction between the psychological properties of the drug and affective states from which the addict was seeking relief (Parulekar *et al.*, 2017).

#### 1.1.1.2 Duncan's hypothesis

This hypothesis focuses on behavioural factors. He described the nature of positive reinforcement for example: high feeling, approval from peers, negative reinforcement for example reduction on negative effects and avoidance of withdrawal symptoms all of which are seen in those who develop problematic drug use, but not all are found in all recreational drug users. Some mental ill patients attempt to correct their illness by use of certain drugs. Depression is often self-medicated with alcohol, tobacco, cannabis or other mind altering drugs. However much they may provide immediate relief of some symptoms for example anxiety, it may provide immediate relief of some symptoms such as several kinds of mental illness (Gupta, 2014).

### 1.1.2 MOSTLY SELF-MEDICATED DRUGS

#### 1.1.2.1 Over–the-counter drugs

OTC drugs are legally allowed to be sold 'Over the Counter', i.e. without the prescription of a registered medical practitioner. The use of OTC medications has been reported to be on a rise as shown by various studies to be twice as common as that of prescribed medication. Most commonly available OTC medications are pain killers, cough and cold remedies, anti-allergy medicines, vitamins and energy tonic. Although these medicines are considered to be risk free and useful for treatment of common health problem, their excessive use can lead to serious side effective and disease resistance mostly when using antibiotics (Shah *et al.*, 2014).

#### 1.1.2.2 Prescription drugs

These are drugs that have to first be prescribed by an authorised medical practitioner before they can be dispensed and taken by a patient. They follow under schedule two of the Drug and Cosmetics Rule, 2016: schedule H and schedule X.

Antibiotics also called antibacterial are type of antimicrobial drugs used for the treatment and prevention of bacterial infections. They either kill or inhibit the growth of bacteria however a limited number of antibiotics like metronidazole also possess antiprotozoal activity (Limaye *et al.*, 2017).

Self-medication habits of antibiotics leads to ineffective and unsafe treatment, exacerbation or prolongation of illness, distress and harm to patient and higher costs. They also lead to the development of disease resistant organisms and hence poor drug therapy response to the pathogen which was initially responsive. It would be a safe practice, if the people who practice self-medication of antibiotics have sufficient knowledge about the indication, dosage, time of intake, side effect on overdose, contraindications of the drug and adverse effect, however such information is lacking to them causing serious effects such as antibiotic resistance, skin problem, hypersensitivity and allergy (BNF, 2018).

Therefore rising need to augment awareness and implement legislation and promote safe practices of medication. Improved knowledge and understanding about self-medication may result in rationale use and thus limit emerging microbial resistance issues (Jan *et al.*, 2016).

Self-medication of antibiotics without prescription is a global phenomenon and a potential contributor to human pathogen resistance to antibiotics. The adverse consequences of such practices should always be emphasized to the community and steps to curb it. Rampant self-

medication of antibiotics without medical guidance may result in greater probability of inappropriate, incorrect or undue therapy, missed diagnosis, delays in appropriate treatment, pathogen resistance and increased mobility (Kamarudin *et al.*, 2016).

## 1.2 STATEMENT OF THE PROBLEM

All adults have unique health needs and suffer from a vast spectrum of diseases. Hence, adults all over Uganda as a whole and Ishaka-bushenyi Municipality in particular need a clear and safe provision of healthcare services especially medication under professional medical supervision, evaluation and prescription. Despite of the presence a general hospital, and several health centers, many of the adult population in Ishaka-bushenyi Municipality do not utilize these services, but have increasingly opted to self-medicate themselves and the people around them without professional medical intervention (Jangu, 2016).

The National Drug Authority in 2010 estimated that in every 10 adult, 8 self-medicate or buy drugs over the counter. This could be attributed to the increase in number of pharmacies and drug shops in the regions, expensive treatment from clinics and long distances to health facilities leading to many health problems like increase in drug resistance, poor compliance, over and under dosing, drug poisoning and toxicity reactions. Thus, in summary, a large number of adults are self-medicating and using old prescriptions from hospitals and clinics to obtain drugs compared to those that actually seek for professional health medication and administration of drugs (Parulekar *et al.*, 2017). This necessitated the need for this research work.

## 1.3 GENERAL OBJECTIVE OF THE STUDY

The general objective of this study was to determine the factors affecting prevalence of self-medication of antibiotics among adult population in Ishaka-Bushenyi Municipality

## 1.4 SPECIFIC OBJECTIVES

The specific objectives of this research were as follows:

I. To determine the prevalence of self-medication of antibiotics and other miscellaneous issues among adult population in Ishaka-Bushenyi Municipality.
II. To establish the socio-demographic characteristics of adult population engaged in self -medication of antibiotics in Ishaka-Bushenyi Municipality.
III. To establish the factors affecting self-medication of antibiotics among adult population in Ishaka-Bushenyi Municipality.

## 1.5 RESEARCH QUESTIONS

I. What was the prevalence of self-medication of antibiotics and other miscellaneous issues among adult population in Ishaka-Bushenyi Municipality?

II. What were are the socio-demographic characteristics of adult population engaged in self -medication of antibiotics in Ishaka-Bushenyi Municipality?

**III.** What were the factors affecting self-medication of antibiotics among adult population in Ishaka-Bushenyi Municipality?

## 1.6 SIGNIFICANCE AND JUSTIFICATION OF THE STUDY.

It is hoped that the findings of this research might be of immense benefit to the Ministry of Health (MOH) and District Health officer (DHO), Non-Government organization (NGOs), National Drug Authority (NDA) and all other sectors that are responsible for the provision of drugs and treatment of people. The study will identify the needs in provision of drugs and find the loopholes in the existing structure. The research will also identify drug provision alternatives as well as possible areas of intervention which will improve professional medical treatment of the sick people.

The Data generated will help planners and policy makers to put organizational or institutional arrangements which will improve the provision of professional medical evaluation, management and prescription of drugs to persons. The findings may add to the existing body of knowledge and may stimulate further research.

## 1.7 CONCEPTUAL FRAME WORK

Independent variables

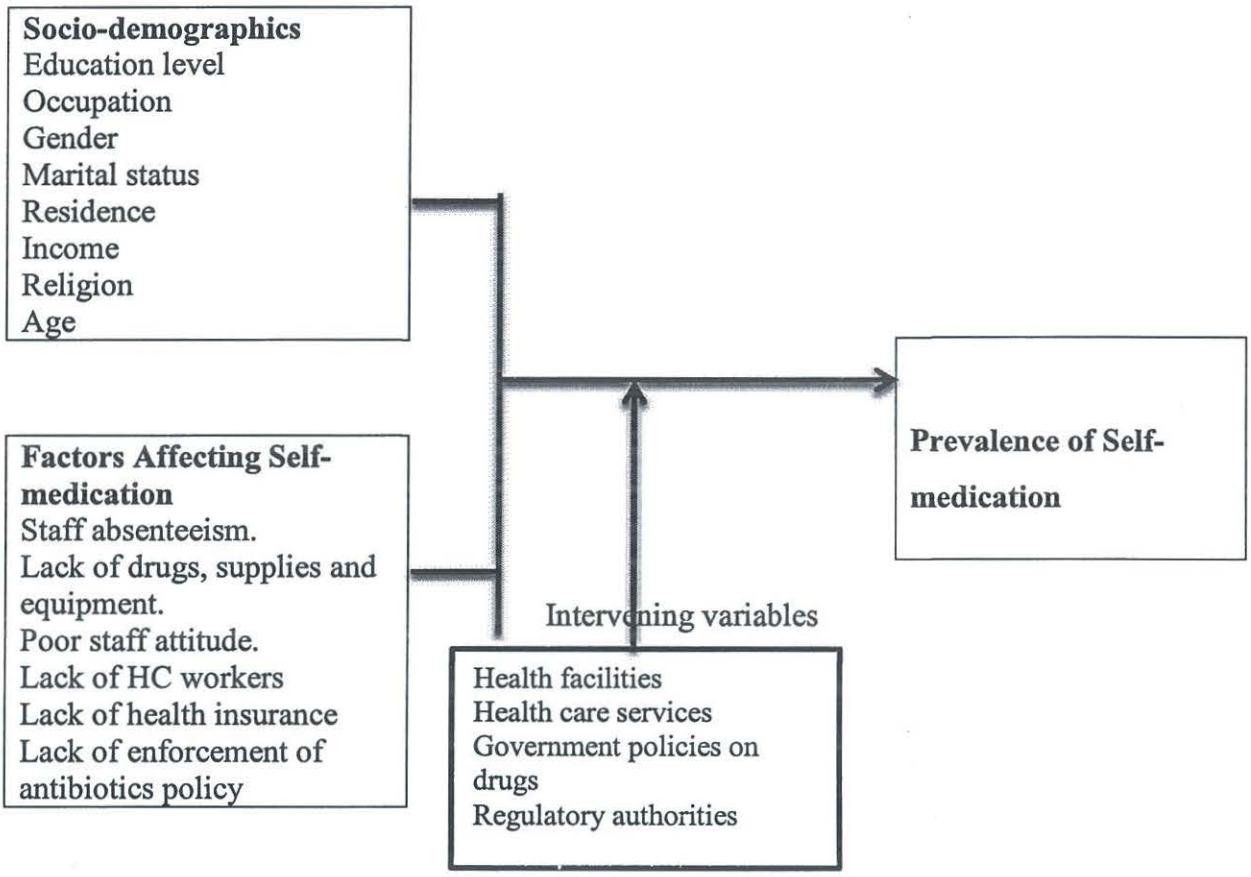


Fig. 1: Conceptual framework schema
Source: Research Data (2018)

## 1.8 EXPLANATION OF CONCEPTUAL FRAMEWORK

The conceptual frame work shows the relationship between the dependent variable (Self-medication) and the independent variables like the socio-demographic characteristics of participants (education level, age, sex, marital status, religion, residence, occupation and minimum monthly income) as seen above and the factors affecting self-medication (staff absenteeism, lack of drugs, supplies and equipment, poor staff attitude, lack of HC workers, lack of insurance and lack of insurance of antibiotic policy) together with the intervening variables like healthcare facilities, government policies on drugs and regulatory authorities.

A variable that is to describe or measure the problem under the study is called the dependent variable and in the study it will be prevalence of self-medication, while those factors directly affecting the dependent variable are the independent variables as described above.

However, there are also some variables that are associated with the problem and with the possible cause of the problem 'intervening variables'.

Of which when they are properly put in place, there will be less prevalence of the problem as seen above.

## 1.9 SCOPE OF THE STUDY

The study was carried out in Ishaka-Bushenyi municipality among adults (18-60 years) with a view to determine the factors affecting prevalence of self-medication; specifically the key areas that were considered include: determination of the prevalence of self-medication of antibiotics and other miscellaneous issues among adult population in Ishaka-Bushenyi Municipality, establishment of the socio-demographic characteristics of adult population engaged in self -medication of antibiotics in Ishaka-Bushenyi Municipality, and establishment of the factors affecting self-medication of antibiotics among adult population in Ishaka-Bushenyi Municipality.

# CHAPTER TWO

## 2.0 LITERATURE REVIEW

### 2.1 INTRODUCTION

According to WHO (2012), the treatment of common diseases using self-medication is being encouraged by the World Health Organization (WHO), as this is thought to help reduce the burden on health care services. It is considered to be of benefit especially to developing countries where there is a challenge of limited healthcare infrastructure and human resource. These countries also lack the capacity to regulate self-medication making it difficult to have a responsible framework for the practice ((Ahmad *et al.,* 2017).

Characteristics of self-medication involves the use of medicinal products by the consumer to treat self-recognized disorders or symptoms, or the intermittent or continued use of a medication prescribed by a physician for chronic or recurring diseases or symptoms. In practice, it also includes use of the medication of family members, especially where the treatment of children or the elderly is involved. In order to use a non-prescription product safely and effectively, the consumer must perform a number of functions normally carried out by a physician treating a patient with a prescription drug. These functions include accurate recognition of the symptoms, setting up of therapeutic objectives, selection of a product to be used, determination of an appropriate dosage and dosage schedule, taking into account the person's medical history, contraindications, concomitant diseases and concurrent medications, and monitoring of the response to the treatment and of possible adverse effects (Parulekar et al., 2017).

For non-prescription medicinal products, all of the information required to permit safe and effective use must come from the labeling material, patient information texts, the individual's previous personal experience, and various sources of information in the media, advertising, and advice given by health care professionals. Pharmacists in particular can play a key role in giving advice to consumers on the proper and safe use of medicinal products intended for self-medication. It is important, therefore, to take this role into account both in their training and in practice. The rapid development of new technology, and especially the Internet and related communication systems, has opened up new possibilities for searching for information. This may eventually offer important new channels for the dissemination of information on medicinal products, their characteristics and proper use in self-medication, although the quality of information may vary. It should be emphasized, however, that there are marked differences in opportunities to obtain access to this information between people

with different socioeconomic and educational backgrounds and in different countries (Scien *et al.*, 2016).

### 2.2 Sources of Medications and Information on Self-Medication

The study done in Egypt likewise many other studies revealed that drugs purchased from private pharmacies were the most common sources of self-medication, as reported by the majority of self-medicated individuals (86.7%), and the use of leftover medicine which is left from prescribed medicine from relatives and friends Was also prevalent and reported by about 80% of respondents. Easy accessibility of medicines from the pharmacy without prescription could explain the high percentage of purchasing from private pharmacies as a major source of the practice of self-medication. Also, keeping medicine at home is an important concern which increases the possibility of self-medication and mistakes in proper consumption (Ghazawy *et al.*. 2017).

Regarding the source of information about the drugs used for self-medication, the commonest source of information was the pharmacists, as reported by about 92% of respondents. This was followed by respondents' experiences or knowledge from previous episodes (84.7%) (Ghazawy *et al.*, 2017).

### 2.3 Potential benefits

The social and economic benefits of self-medication reflect the fact that it is voluntarily chosen by consumers for conditions where it seems preferable to them. It will usually be selected for use in symptoms and conditions which the user regards as sufficiently troublesome to need medicinal treatment but not to justify consulting a physician. Only if the condition fails to respond, persists or becomes more severe will professional medical help be sought(Studies, 2018).

Accordingly, good self-medication should offer the individual consumer:

i. Efficacy: that is to say the product does what it is claimed to do.
ii. Reliability and safety: the individual will often choose a product which experience has shown to be suitable. The scope and duration of self-medication can be kept within safe limits by appropriate selection of approved indications, labeling texts, dosage strengths and forms, and package sizes.
iii. Product safety when used as recommended in the instructions.
iv. Acceptable risk, even when used for a longer duration, at a higher dose, or somewhat differently than recommended in the instructions.
v. Wider availability of medicines.

vi. Greater choice of treatment.
vii. Direct, rapid access to treatment.
viii. An active role in his or her own health care.
ix. Self-reliance in preventing or relieving minor symptoms or conditions.
x. Convenience.
xi. Economy, particularly since medical consultations will be reduced or avoided. (Sheha et al 2016).

At the community level, good self-medication can also provide benefits such as saving scarce medical resources from being wasted on minor conditions, lowering the costs of community-funded health care programs (including prescription reimbursement systems), and reducing absenteeism from work due to minor symptoms.

**2.4 Potential risks**

Self-medication has a number of potential risks. In particular, the ordinary user will usually have no specialized knowledge of the principles of pharmacology or therapy, or of the specific characteristics of the medicinal product used. This results in certain potential risks for the individual consumer (Gopalakrishnan, 2015).

These risks include:

I. Incorrect self-diagnosis.
II. Incorrect choice of therapy.
III. Failure to recognize special pharmacological risks.
IV. Failure Rare but severe adverse effects.
V. Failure to recognize or self-diagnose contraindications, interactions, warnings and precautions.
VI. Failure to recognize that the same active substance is already being taken under a different name (products with different trademarks may have the same active ingredient).
VII. Failure to report current self-medication to the prescribing physician (risk of double medication or harmful interaction).
VIII. Failure to recognize or report adverse drug reactions.
IX. Incorrect route or manner of administration.
X. Inadequate or excessive dosage.
XI. Excessively prolonged use.
XII. Risk of dependence and abuse.

XIII. At the community level, improper self-medication could result in an increasing drug-induced disease and in wasteful public expenditure.

It is important to realize that many of these risks are not unique to self-medication: they can also occur in the prescription situation, particularly, if the patient consults several physicians for the illness or lacks counseling during therapy. In selecting the types of medicinal products that can be used for self-medication, the aim should be to exploit the benefits listed above and to minimize the risks

**2.5 Conditions mostly treated by self-medication**

The conditions mostly treated by self-medication include headache, body ache, cough, cold, constipation, loose motion, acidity, generalized weakness, sleep lessens (insomnia), fever, infection, joint pain, burns, menstrual pain, and insect bites etc. (Divya *et al.*, 2016)

# CHAPTER THREE

## 3.0 METHODOLOGY

## 3.1 AREA OF STUDY

The study was carried out in Ishaka-Bushenyi Municipality. This particular study area was selected because it has a mixture of both urban and rural population hence being representative of the Uganda population.

## 3.2 STUDY DESIGN

A descriptive, cross-sectional study design was used for this study conducted in the community.

## 3.3 STUDY POPULATION

It included adults (18-60 years) residing in the Ishaka-Bushenyi Municipality

## 3.4 SAMPLE SIZE DETERMINATION

The sample size was determined using a formula; **Cochran formula** developed in 1977 to calculate a representative sample for study as

$N_0 = (Z^2PQ) / E^2$

where, $N_0$ is the sample size, $Z$ is the selected critical value of desired confidence level, $P$ is the estimated proportion of an attribute that is present in the population, $Q$ =1-P and $E$ is the desired level of precision . Assuming the maximum variability, which is equal to 50% (P =0.5) and taking 95% confidence level with ±5% precision

$$N_0 = (1.96^2 \times 0.5 \times 0.5)/0.05^2$$

$$N_0 = 384.16 = 384.$$

Therefore the sample size will be 384 respondents.

## 3.5 Inclusion and exclusion criteria

### 3.5.1 Inclusion criteria

Anyone who had felt sick in the past one year was included. The study included mentally sound adults (above 18 years and not more than 60 years) after their consent to participate.

### 3.5.2 Exclusion criteria

Mentally unsound adults, who did not remember when he/she was sick and those who denied their consent, were excluded.

### 3.6 Sample technique
Selection of the participants was based on simple random sampling method.

### 3.7 Data collection methods
Data was collected through a structured, validated, self-administered questionnaire.

### 3.8 Data collection instrument
The data collection instruments was structured, validated questionnaire

### 3.9 Data Analysis Method and Presentation
The collected data was entered into MS Excel 2010 and analysed using STATA 13. The results were presented as frequencies, percentages, odds ratio, and 95% confidence interval.

### 3.10 Data Quality Control

To ensure quality of data that was collected, the questionnaire was sent to the research supervisor to assess its validity and relevance of the each item in the questionnaire to the objectives; and finally rate each on the scale of very relevant (4), quite relevant (3), somewhat relevant (2) and not relevant (1). The questions within the questionnaire were examined for face, content and criterion validity. This identified questions that need to be rephrased so as to make them easier to be understood by the research respondents.

### 3.11 Ethical Consideration
The research proposal was submitted to the Institutional Research Ethics Committee (IREC) for approval; consent from the respondents was sought after giving them the specific objectives and importance of the study. The research participants were assured that the information they provide was to be confidential and their names withheld from the study to protect their identity. Confidentiality of the information got from the respondents was to be highly respected.

### 3.12 Limitation and Delimitation of the Study:
The study was based on self-reported data about self-medication of antibiotics hence recall bias cannot be ruled out. This was delimited by using high quality questionnaire and the respondents allowed sufficient time for appropriate recall of long term memory. Where the respondents requested enough time to fill the questionnaire, they were asked whether they would be able to read, understand and interpret the questions in the questionnaire and where they could do so, they were left with the questionnaire and requested to fill it when they get time. The date of questionnaire collection when they were to be done with filling the questionnaire was also requested

# CHAPTER FOUR:

# RESULTS

## 4.0 INTRODUCTION

In this chapter, the results obtained from the 384 respondents who participated in the study were presented and interpreted for easy comprehension. The results were in line with the objectives of the study.

### 4.1 Social demographic characteristics of participants:

**Table 1 below**, showed the Social demographic characteristics of participants involved in the study. Out of 384 respondents, 103 (26.82%), 96 (25.00%), 58 (15.10%), 59 (15.36%), 34 (8.85%) and other 34 (8.85%) were in the age groups of 18-24 years, 25-29 years, 30-35 years,-36-40 years, 41-50 years and, 51-60 years respectively. Of the 103 participants in the age group 18-24 years, 24 (6.25%) were not self-medicating antibiotics while 79 (20.50%) were self-medicating. Of the 96 respondents in the age range of 24-29 years, 14 (3.65%) were not self-medicating antibiotics while 82 (21.35%) were self-medicating antibiotics. Of the58 participants in the age group 30-35 years, 10 (4.17%) were not self-medicating while 42 (10.93%) was self-medicating antibiotics. Of the 59 participants in the age group 36-40 years, 17 (4.43%) were not self-medicating while 42 (10.93%) were self-medicating antibiotics. Of the 34 participants in the age group 41-50 years, 11 (2.86%) were not self-medicating while 23 (5.99%) were self-medicating antibiotics. Furthermore, of the34 participants in the age group 51-60 years, 21 (5.47%) were not self-medicating antibiotics while13 (3.38%) were self-medicating antibiotics.

Of 384 participants, 201 (52.34%) were male and 183 (47.66%) were female. And of 201 (52.34%) male respondents, only 52 (13.54%) had never self-medicated antibiotics in the past one year while 149 (38.80%) had self-medicated. And out of 183 (47.66%) female respondents, 51 (13.28) had never self-medicated antibiotics in the past one year up to data collection time while 132 (34.38%) had self-medicated antibiotics.

Out of a total of 384 participants, 198 (51.56%) were residing in the urban and 186 in the rural areas. And out of 198 participants residing in the urban, 156 (40.63%) had ever self-medicated with an antibiotic while 42 (10.94%) had never self-medicated. Likewise, out of the 384 participants, 193 (50.26%) were married, 160 (41.67%) single and 31 (8.07%) divorced and of 193 married participants, 55 (14.32%) were not self-medicating while 136

(35.42%) were self-medicating with antibiotics. Of 160 single participants, 32 (8.33%) were not self-medicating while 128 (33.33%) were self-medicating with antibiotics. And finally of the 31 divorced participants, 16 (4.17%) were not self-medicating while 15 (3.91%) were self-medicating with antibiotics.

Of the 384 participants, 8 (2.08%) had no formal education, 86 (22.40%) ended in primary level, 117 (30.47%) secondary level and finally 173 (45.05%) had attained tertiary education or its equivalent. Of the 8 participants with no formal education, 7 (1.82%) had never self-medicated antibiotics while only 1 (0.36%) had self-medicated antibiotics between the time of data collection up to the past one year and of the 86 participants who at most attained primary level of education, 32 (8.33%) were not self-medicating while 54 (14.06%) were self-medicating. Out of the 117 participants who at most attained secondary education, 30 (7.81%) were not self-medicating while 87 (22.66%) were self-medicating. And finally of the173 participants who attained tertiary level of education, 34 (8.85%) were not self-medicating while 139 (36.20%) were self-medicating.

Out of the 384 participants, 166 (43.23%) had traditional occupations like the ones described above, 128 (33.33%) had modern occupation and the remaining 90 (23.44%) were students. 0f 166 participants with traditional occupation, 67 (17.45%) were not self-medicating while 99 (25.78%) were self-medicating with antibiotics. And of 128 participants with modern occupation, only 28 (7.29%) were not self-medicating while the majority 100 (26.04%) were self-medicating. And finally, of the 90 students, only 8 (2.08%) were not self-medicating with antibiotics while the rest 82 (21.35%) had self-medicated at least in the past one year.

Out of the total 384 participants, 271 (70.57) were Christians while the remaining 110 (28.64%) were Moslems and 3 were neither Christians nor Moslems. Of the 271 Christians who participated, 72 (18.75%) had not self-medicated while the remaining 179 (46.61%) were self-medicating. On the other hand, out of 110 Moslems, 30 (7.82%) were not self-medicating while the majority; 80 (20.83%) were self-medicating antibiotics. And finally, of the 3 in other religions, 2 (0.52%) were self-medicating and only 1 (0.26%) were not.

Finally, of 118 participants who earn very low monthly income, 35 (9.11%) were not self-medicating while 83 (21.61%) were practicing self-medication of antibiotics. Of 108 participants earning low monthly income, 26 (6.77%) were not self-medicating while the majority; 82 (21.35%) were practicing self-medication of antibiotics. Of 73 participants earning high monthly income, 25 (6.51%) were not self-medicating while 48 (12.50%) were

practicing self-medication of antibiotics. And of the remaining 85 participants earning very high monthly income, 17(4.43%) were not self-medicating while 68 (17.71%) were practicing self-medication of antibiotics.

**TABLE 1: SOCIAL DEMOGRAPHICS CHARACTERISTTICS OF PARTICIPANTS SHOWING LEVELS OF SELF-MEDICATION**

| | | | SELF-MEDICATION | |
|---|---|---|---|---|
| Variables | Freq.($N_0$) | Percentage (%) | Self-medicating (%) | Not self-medicating (%) |
| 1.age (yrs.) | | | | |
| 18-24 | 103 | 26.86 | 79 (20.50) | 24 (6.25) |
| 25-29 | 96 | 25.00 | 82 (21.35) | 14 (3.65) |
| 30-35 | 58 | 15.10 | 42 (10.94) | 10 (4.17) |
| 36-40 | 59 | 15.36 | 42 (10.94) | 17 (4.43) |
| 41-50 | 34 | 8.85 | 23 (5.99) | 11 (2.86) |
| 51-60 | 34 | 8.85 | 13 (3.38) | 21 (5.47) |
| Total | 384 | 100.00 | 281 (73.18) | 103 (26.82) |
| 2. sex | | | | |
| Male | 201 | 52.34 | 149 (38.88) | 52 (13.54) |
| Female | 183 | 47.66 | 132 (34.38) | 51 (13.28) |
| Total | 384 | 100.00 | 281 (73.18) | 103 (26.82) |
| 3.residence | | | | |
| Urban | 198 | 51.56 | 156 (40.63) | 42 (10.94) |
| Rural | 186 | 48.44 | 125 (32.55) | 61 (15.89) |
| Total | 384 | 100.00 | 281 (73.18) | 103 (26.82) |
| Marital status | | | | |
| Married | 193 | 50.26 | 136 (35.42) | 55 (14.32) |
| Single | 160 | 41.67 | 128 (33.33) | 32 (8.33) |
| Divorced | 31 | 8.07 | 15 (3.91) | 16 (4.17) |
| Total | 384 | 100.00 | 281 (73.18) | |
| 5.Education | | | | |
| No formal | 8 | 2.08 | 1 (0.26) | 7 (1.82) |
| Primary | 86 | 22.40 | 54 (14.06) | 32 (8.33) |
| Secondary | 117 | 30.47 | 87 (22.66) | 30 (7.81) |

| | | | | |
|---|---|---|---|---|
| Tertiary | 173 | 45,05 | 139 (36.20) | 34 (8.85) |
| Total | 384 | 100.00 | 281 (73.18) | 103 (26.82) |
| 6.occupation | | | | |
| Traditional | 166 | 43.23 | 99 (25.78) | 67 (17.45) |
| Modern | 128 | 33.33 | 100 (26.04) | 28 (7.29) |
| Student | 90 | 23.44 | 82 (21.35) | 8 (2.08) |
| Total | 384 | 100.00 | 281 (73.18) | 103 (26.82) |
| 7. Religion | | | | |
| Christianity | 271 | 70.57 | 179 (46.61) | 72 (18.75) |
| Islam | 113 | 29.43 | 82 (21.35) | 31 (8.07) |
| Others | | | | |
| Total | 384 | 100.00 | 281 (73.18) | 103 (26.82) |
| 8.Min monthly in. | | | | |
| Very low | 118 | 30.73 | 83 (21.61) | 35 (9.11) |
| Low | 108 | 28.13 | 82 (21.35) | 26 (6.77) |
| High | 73 | 19.01 | 48 (12.50) | 25 (6.51) |
| Very high | 85 | 22.13 | 68 (17.71) | 17 (4.43) |
| Total | 384 | 100.00 | 281 (73.18) | 103 (26.82) |
| Minimum monthly income level | | | | |

**4.2: ISUES ON SELF-MEDICATION**

Out of 384 participants, 281 (73.18%) were self-medicating antibiotics thereby giving a prevalence rate of 73.18%, while 103 (26.82%) did not self-medicate at least in the previous one year. Eighty one (21.36%) reported to be always self-medicating antibiotics whenever sick, state the number before % 78 % rarely self-medicate when sick, 121 (31.51%) sometimes self-medicate when sick and finally 103 (26.82%) reported that they never self-medicated when sick in the past one year.

The majority, 86 (30.60%) self-medicated after getting information from friends, followed by 81 (28.83%) who got information from previous prescriptions, while 51 (19.57%) got information from advertisement, 50 (17.79%) from family members and finally ŧ 34 (12.59%) reported getting information from different sources other than those mentioned above, like

from experience as many of them stated. The remaining 71 (20.05%) reported multiple source of information as they could not specify the source of information.

Metronidazole 55 (19.57%) was the most self-medicated antibiotic reported, followed by Amoxicillin 36 (12.81%) for cough, cold and sore throat plus also other indications, Doxycycline 34 (12.10%), Ciprofloxacin 32 (11.39%), Septrin 31 (11.03%), Amoxiclav 27 (9.61%), Penicillin V 21 (7.47%), and Tetracycline 17 (6.05%) mostly for ocular symptoms especially among the old. However, 28 participants (9.97%) did not specify the antibiotics they were using since they self-medicated multiple ones at the same time.

The indications given by the participants for the antibiotics self-medicated on were cough and cold reported by 89 participants (31.67%), followed by headache, fever & malaria 69 (23.13%), stomach ache, vomiting and diarrhoea 48 (17.08%), menstrual symptoms accounting for 21 (7.47%) and 27 (9.60%) for other indications other than those mentioned while 16 (5.7%) above. The remaining percentage 15 (4.0%) reported multiple indications for self-medication with antibiotics.

The need for quick relief of the symptoms of the disease 78 (27.76%) and the perception of no need to visit the doctor for minor illness 74 (26.33%) were the main reasons they reported in favour of self-medication of antibiotics; others reasons reported include: time saving 32 (11.38%), ease and convenience 31 (11.03%), confidence of the knowledge about medicine 26 (9.25%) as reported mostly by participants with a bit of knowledge about medicine, learning opportunity 21 (7.45%) reported mostly by students. The least reasons reported was crowd avoidance by only 1 participant (0.36%). Some participants 19 (6.08%) had multiple overlapping reasons in favour of their self-medication of antibiotics.

Finally of the 103 (26.82%): those who had not self-medicated antibiotics at least in the previous one year period, they mostly reported lack of knowledge about medicine 34 (34.95%), risk of adverse effects 24 (23.30%) and risk of misdiagnoses 22 (21.36%) as the main reasons in favour of their choice. Other minor reasons included the following: Risk of using wrong drugs as reported by only 5 participants (4.86%), risk of using wrong dose of drug 5 (4.86%), risk of drug dependence 2 (1.94%) and only 4 participants (3.88%) reporting other reasons which they did not specify while the remaining participants; 5 (4.85%) had multiple of the above reasons.

## 4.3 RELATIONSHIP BETWEEN SELF-MEDICATION OF ANTIBIOTICS AND SOCIO-DEMOGRAPHICS CHARACTERISTICS OF PARTICIPANTS [Univariate Analysis]

Table 2 below showed the relationship between self-medication of antibiotics by the participants and the socio-demographic parameters at univariate level.

From the table 2 below, there was statistical significant relationship between self-medication of antibiotics and age (P=<0.0001). The likelihood of self-medication was statistically lower among the age group 51-60 years [COR=0.188, P=<0.0001, 95%CI (0.082 to 0.431)], but only lower among the age groups, 41-50 years [COR=0.635], 36-40 years [COR=0.751], 30-35 years [COR=0.797] and higher among the age group 25-29 years [COR=1.779] respectively than the reference age group, 18-24 years [COR=1].

In order of higher tendency for self-medication, age group 25-29 years topped the list followed by 30-35 years, 36-40 years, 41-50 years and age group 51-60 years respectively.

There was no statistical significant relationship between self-medication of antibiotics and sex of participants, but the likelihood of self-medication was lower among the female participants [COR=0.903] than the reference participant, the male [COR=1].

The relationship between self-medication of antibiotics and place of residence was statistically significant (P=0.010) and the likelihood of self-medication was statistically lower among the rural residents [COR=0.552, P=0.011, 95%CI (0.349 to 0.872)] than the reference urban residents [COR=1].

There was statistical significant relationship between self-medication of antibiotics and the marital status of the participants (P=0.002), and the likelihood of self-medication was statistically lower among the divorced women [COR=0.374, P=0.012, 95%CI (0.173 to 0.807)] than the reference women who were married [COR=1] and the single women [COR=1.594], but higher among the single women than the married reference women.

The relationship between self-medication of antibiotics and the educational level of participants was statistically significant (P=0.0001). The likelihood of self-medication was statistically very high among those with tertiary education [COR=28.62, P=0.002, 95%CI (3.406 to 240.5)], secondary education [COR=20.3, P=0.006, 95%CI (2.398 to 171.8)], and primary education [COR=11.82, P=0.024, 95%CI (1.389 to 100.4)] respectively than the reference group without formal education [COR=1].

There was also statistical signification relationship between self-medication and the occupation of the participants (P=<0.0001) and the likelihood of self-medication was statistically higher among the students and apprentice [COR=6.937, P<0.0001, 95%CI (3.150 to 15.28)] and those on modern occupation e.g. civil-servants, business [COR=2.417, P=0.001, 95%CI (1.435 to 4.071)] than the reference group who were on traditional occupation e.g. housewife, farming [COR=1].

Although, there was no statistical significant relationship between self-medication and religion, the likelihood of self-medication was lower among those who were neither Christians nor Moslems [0.721] and the Moslem [COR=0.953] than reference group who were Christians [COR=1].

Similarly, like religion, there was no statistical significant relationship between self-medication and monthly income of the participants, but the likelihood of self-medication was higher among those in the high income [COR=1.687] and those in the low income [COR=1.330], but lower among those in the middle income [COR=0.810] than the reference group, in the very low income level [COR=1].

**Table 2: RELATIONSHIP BETWEEN SELF-MEDICATION OF ANTIBIOTICS AND SOCIO-DEMOGRAPHICS CHARACTERISTICS OF PARTICIPANTS [Univariate Analysis]**

| self-medication | COR | Z p-value | 95% C.I | $Chi^2$ p-value |
|---|---|---|---|---|
| **Age (yrs.)** | | | | <0.0001 |
| 18- 24 years | 1 (ref) | Ref | Ref | |
| 25- 29 years | **1.779** | 0.121 | 0.859- 3.684 | |
| 30- 35 years | 0.797 | 0.546 | 0.382- 1.663 | |
| 36- 40 years | 0.750 | 0.438 | 0.363- 1.550 | |
| 41- 50 years | 0.188 | 0.296 | 0.271- 1.488 | |
| 51- 60 years | 0.188 | <0.0001 | 0.082- 0.431 | |
| **Sex** | | | | 0.659 |
| Male | 1 (ref) | 1 (ref) | Ref | |
| Female | 0.903 | 0.659 | 0.575- 1.419 | |
| **Residence** | | | | 0.0103 |
| Urban | 1 (ref) | 1 (ref) | Ref | |
| Rural | 0.551 | 0.011 | 0.349- 0.872 | |

| | | | | |
|---|---|---|---|---|
| **Marital status** | | | | 0.0016 |
| Married | 1 (ref) | 1 (ref) | Ref | |
| Single | **1.594** | 0.066 | 0.969- 2.62 | |
| Divorced | 0.374 | 0.012 | 0.173- 0.807 | |
| **Education level** | | | | 0.0001 |
| No formal | 1 (ref) | 1 (ref) | Ref | |
| Primary | **11.81** | 0.024 | 1.389- 100.4 | |
| Secondary | **20.30** | 0.006 | 2.398- 171.9 | |
| Tertiary | **26.62** | 0.002 | 3.406- 240.5 | |
| **Occupation** | | | | <0.0001 |
| Traditional | 1 (ref) | 1 (ref) | Ref | |
| Modern | **2.417** | 0.001 | 1.435- 4.070 | |
| Student | **6.937** | <0.0001 | 3.150- 15.276 | |
| **Religion** | | | | 0.952 |
| Christianity | 1 (ref) | 1 (ref) | Ref | |
| Islam | 0.953 | 0.850 | 0.581- 1.563 | |
| Others | 0.721 | 0.791 | 0.641- 8.072 | |
| **Minimum monthly income** | | | | 0.173 |
| Very low | 1 (ref) | 1 (ref) | Ref | |
| Low | **1.330** | 0.345 | 0.735- 2.404 | |
| High | 0.810 | 0.507 | 0.434- 1.512 | |
| Very high | **1.667** | 0.122 | 0.870- 3.271 | |

## 4.4 RELATIONSHIP BETWEEN SELF-MEDICATION OF ANTIBIOTICS AND SOCIO-DEMOGRAPHICS CHARACTERISTICS OF PARTICIPANTS [MULTIVARIATE ANALYSIS]

Table 3 below showed the relationship between self-medication of antibiotics and the socio-demographic parameters of participants following multivariate analysis.

From table 3 below, there was statistical significant relationship between self-medication of antibiotics and age having controlled for the effects of other variables on the relationship [P=<0.0001]. The likelihood of self-medication was however, statistically lower among the age 51-60 years [AOR=0.302, P=0.014, 95%CI (0.116 to 0.783)], and statistically higher among the age 25-29 years [AOR=2.316, P=0.042, 95%CI (1.031 to 5.202)], but higher

among the age 41-50 years [AOR=1.005], 36-40 years [AOR=1.517], and 30-35 years [AOR=1.177] respectively than the reference age 18-24 years [AOR=1].

There was also statistical significant relationship between self-medication and the sex of participants having adjusted for the effects of other variables (P=<0.0001), and the likelihood of self-medication was higher among the female [AOR=1.273] than the reference male participants [AOR=1].

The relationship between self-medication and place of residence was also statistically significant (P=<0001) having adjusted for effects of other variables, and the likelihood of self-medication was lower among the rural dwellers [AOR=0.693] than the reference urban dwellers [AOR=1].

In the same way, there was statistical significant relationship between self-medication and marital status of participants (P=<0.0001) having controlled for the effects of other variables. The likelihood of self-medication was however, lower among the divorced women [AOR=0.442] and the single women [AOR=0.888] than the reference married women [AOR=1].

Additionally, there was statistical significant relationship between self-medication and educational level of participants (P=<0.0001), having adjusted for the effects of all other variables and likelihood of self-medication was statistically higher among those with secondary education [AOR=9.20, P=0.041,95%CI (1.098 to 87.81)], but higher among those with tertiary education [AOR=7.947] and those with primary education [AOR=6.741] respectively than the reference group who have no formal education [AOR=1].

There was also statistical significant relationship between self-medication and occupation (P=<0.0001), having controlled for the effects of other variables. The likelihood of self-medication was statistically very high among the students and apprentice [AOR=5.026, P=<0001, 95%CI (2.124 to 11.89)], but higher among those in the modern occupation (civil servants, professionals, business) [AOR=1.789] than the reference group in the traditional occupation [AOR=1].

The relationship between self-medication and religion was also statistically significant (P=<0.0001), when the effects of other variables were controlled. The likelihood of self-medication was found to be higher among the Moslems [AOR=1.113] and those who ~~do~~

neither believe in Christianity nor Islam [AOR=1.003] than the Christian reference group [AOR=1].

Finally, there was statistical significant relationship between self-medication and the monthly income of the participants (P=<0.0001), when the effects of other variables were controlled. The likelihood of self-medication was higher among those on low income [AOR=1.938], those on high income [AOR=1.510], and those on middle income [AOR=1.O83] respectively than the reference group on very low income [AOR=1].

**TABLE 3: RELATIONSHIP BETWEEN SELF-MEDICATION OF ANTIBIOTICS AND SOCIAL DEMOGRAPHICS CHARACTERISTICS OF PARTICIPANTS (MULTIVARIATE ANALYSIS)**

| **Self-medication** | AOR | Z p-value | 95% C.I | $Chi^2$ p- value |
|---|---|---|---|---|
| **Age** | | | | < 0.0001 |
| 18- 24 years | 1 (Ref) | (Ref) | (Ref) | |
| 25-29 years | 2.316 | 0.042 | 1.031- 5.202 | |
| 30- 35 years | 1.117 | 0.705 | 0.505- 2.741 | |
| 36- 40 years | 1.517 | 0.339 | 0.646- 3.565 | |
| 41- 50 years | 1.005 | 0.993 | 0.584- 2.623 | |
| 51- 60 years | 0.302 | 0,014 | 0.116- 0.783 | |
| **Sex** | | | | <0.0001 |
| Male | 1 (Ref) | (Ref) | (Ref) | |
| Female | 1.273 | 0.351 | 0.767- 2.112 | |
| **Residence** | | | | <0.0001 |
| Urban | 1 (Ref) | (Ref) | (Ref) | |
| Rural | 0.630 | 0.152 | 0.420- 1.144 | |
| **Married status** | | | | <0.0001 |
| Married | 1 (Ref) | (Ref) | (Ref) | |
| Single | 0.888 | 0.691 | 0.493- 1.596 | |
| Divorced | 0.442 | 0.053 | 0.194- 1.012 | |
| **Education level** | | | | <0.0001 |
| No formal | 1 (Ref) | (Ref) | (Ref) | |
| Primary | 6. 740 | 0.088 | 0.751- 60.531 | |
| Secondary | 9.820 | 0.041 | 1.098- 87.806 | |

| | | | | |
|---|---|---|---|---|
| Tertiary | 7.947 | 0.069 | 0.852- 74.084 | |
| **Occupation** | | | | <0.0001 |
| Traditional | 1 (Ref) | (Ref) | (Ref) | |
| Modern | 1.789 | 0.073 | 0.946- 3.384 | |
| Student | 5.026 | <0.0001 | 2.124- 11.890 | |
| **Religion** | | | | <0.0001 |
| Christianity | 1 (Ref) | (Ref) | (Ref) | |
| Islam | 1.113 | 0.696 | 0.651- 1.900 | |
| Others | 1.003 | 0.998 | 0.719- 13.992 | |
| **Monthly income** | | | | <0.0001 |
| Very low | 1 (Ref) | (Ref) | (Ref) | |
| Low | 19.939 | 0.055 | 0.985- 3.815 | |
| High | 1,083 | 0.825 | 0.533- 2.200 | |
| Very high | 1.510 | 0.279 | 0.716-3.183 | |

## 4.5 FACTORS AFFECTING SELF-MEDICATION OF ANTIBIOTICS [UNIVARIATE ANALYSIS]

Table 4 below, was a presentation of the factors affecting self-medication of antibiotics at the univariate level of analysis.

### 4.5.1 Long distance to health care facilities

From the table 4 below, there was statistical significant relationship between self-medication of antibiotics and long distant to the healthcare facility (P=<0.0001). The likelihood of self-medication was statistically very low among participants who disagreed that long distant can made them to self-medicate [COR=0.046, P=<0.0001, 95%CI (0.017 to 0.128)] and statistically lower among those who agreed that long distant can made them to self-medicate [COR=0.244, P=<0.0001, 95%CI (0.143 to 0.416)] than the reference group who strongly agreed that long distance to the facility can made them to self-medicate [COR=1].

### 4.5.2 Lack of access to health care facilities

There was also statistical significant relationship between self-medication and lack of access to healthcare facility (P=<0.0001), and the likelihood of self-medication was statistically very low among those who disagreed that lack of access will lead them to self-medication [COR=0.057, P=<0.0001, 95%CI (0.015 to 0.213)] and statistically lower among the participants who agreed that lack of access will lead them to self-medication [COR=0.518,

P=0.008, 95%CI (0.318 to 0.844)] than the reference group who strongly agreed that lack of access will lead to self-medication [COR=1].

### 4.5.3 Non affordability of health care services

The relationship between self-medication and non-affordability of healthcare services was statistically significant (P=0.003). The likelihood of self-medication was statistical lower among those who disagreed that non-affordability can lead to self-medication [COR=0.232, P=0.001, 95%CI (0.097 to 0.553)], and lower among those who agreed that non-affordability can lead to self-medication [COR=0.646] than the reference group who strongly agreed that non-affordability can lead to self-medication [COR=1].

### 4.5.4 Non availability of health care facilities

There was also statistical significant relationship between self-medication and non-availability of healthcare facility (P=<0.0001). The likelihood of self-medication was statistically lower among those who disagreed that non-availability of healthcare facility can lead to self-medication [COR=0.140, P=<0.0001, 95%CI (0.053 to 0.370)], and lower among those who agreed that it can lead to self-medication [COR=0.748], than the reference group who strongly agreed that non-availability of healthcare facility can lead to self-medication [COR=1].

### 4.5.5 Lack of drugs in health care facility

The relationship between self-medication and lack of drugs in healthcare facility (HCF) was statistically significant (P=0.002), and likelihood of self-medication was statistically lower among those who disagreed that lack of drugs could lead to self-medication [COR=0.244, P=<0.0001, 95%CI (0.111 to 0.535)] and lower among those who agreed that it could lead to self-medication [0.841], than the reference group who strongly agreed that lack of drugs could lead to self-medication [COR=1].

### 4.5.6 Lack of health care workers in health care facilities

There was also statistical significant relationship between self-medication and lack of healthcare workers (HCWs) in HCF (P=0.014). The likelihood of self-medication was statistically lower among those who disagreed that lack of HCWs could lead to self-medication [COR=0.289, P=0.003, 95%CI (0.127 to 0.660)], but lower among those who agreed that it could lead to self-medication [0.767], than the reference group who strongly agreed that lack of HCWs could lead to self-medication [COR=1].

### 4.5.7 Health care worker attitude

In the contrary, there was no statistical significant relationship between self-medication and the attitude of HCWs, but the likelihood of self-medication was statistically lower among those who disagreed that the attitude of HCWs could lead them to self-medication [COR=0.480, P=0.030, 95%CI (0.247 to 0.931)], and also lower among those who agreed that it could lead to self-medication [COR=0.735] than the reference group who strongly agreed that the attitude of HCWs could lead to self-medication [COR=1].

### 4.5.8 Lack of health insurance policy

The relationship between self-medication and lack of health insurance policy among the participants was statistically significant (P=0.004). The likelihood of self-medication was statistically lower among those who disagreed that lack of health insurance policy could lead them to self-medication [COR=0.342, P=0.003, 95%CI (0.170 to 0.689)], and further lower among those who agreed that it could lead to self-medication [COR=0.698] than the reference group who strongly agreed that lack of health insurance policy could lead to self-medication [COR=1].

### 4.5.9 Lack of enforcement of antibiotic policies

Finally, in the univariate logistic regression analysis, there was statistical significant relationship between self-medication and lack of enforcement of antibiotic policies (P=0.001), and the likelihood of self-medication was statistically lower among those who disagreed that lack of enforcement of antibiotic policies could lead them to self-medication [COR=0.393, P=0.003, 95%CI (0.211 to 0.734)], but lower among those who agreed that it could lead them to self-medication [COR=0.949] than the reference group who strongly agreed that lack of enforcement of antibiotic policies could lead to self-medication [COR=1].

**TABLE 4: FACTORS AFFECTING SELF-MEDICATION OF ANTIBIOTICS [UNIVARIATE ANALYSIS]**

| Self- medication | COR | Z p- values | 95% C.I | $Chi^2$ p-value |
|---|---|---|---|---|
| **Long distance** | | | | <0.0001 |
| Strongly agree | 1 (Ref) | Ref | Ref | |
| Agree | 0.244 | <0.0001 | 0.143- 0.416 | |
| Disagree | 0.046 | <0.0001 | 0.166- 0.128 | |
| **Lack of acess.HC** | | | | <0.0001 |
| Strongly agree | 1 (Ref) | 1 (Ref) | Ref | |
| Agree | 0.518 | O.008 | 0.318- 0.844 | |

| | | | | |
|---|---|---|---|---|
| Disagree | 0.057 | <0.0001 | 0.015- 0.213 | |
| Lack of accessibility to healthcare services | | | | |
| **Non-afford. HCS** | | | | 0.003 |
| Strongly agree | 1 (Ref) | 1 (Ref) | Ref | |
| Agree | 0.646 | 0.075 | 0.400- 1.044 | |
| Disagree | 0.232 | 0.001 | 0.897- 0.553 | |
| Non affordability of healthcare services | | | | |
| **Non-availb .HCF** | | | | <0.0001 |
| Strongly agree | 1 (Ref) | 1 (Ref) | Ref | |
| Agree | 0.740 | 0.236 | 0.463- 1.209 | |
| Disagree | 0.140 | <0.0001 | 0.053- 0.340 | |
| Non availability of healthcare facility | | | | |
| **Lack of drugs** | | | | 0.002 |
| Strongly agree | 1 (Ref) | 1 (Ref) | Ref | |
| Agree | 0.841 | 0.487 | 0.517- 1.368 | |
| Disagree | 0.244 | <0.0001 | 0.111- 0.535 | |
| **Lack of HCW** | | | | 0.014 |
| Strongly agree | 1 (Ref) | 1 (Ref) | Ref | |
| Agree | 0.767 | 0.284 | 0.472 -1.245 | |
| Disagree | 0.289 | 0.003 | 0,127- 0.660 | |
| Lack of health care workers | | | | |
| **Poor HCW attit.** | | | | 0.095 |
| Strongly agree | 1 (Ref) | 1 (Ref) | Ref | |
| Agree | 0.735 | 0.244 | 0.438-10.233 | |
| Disagree | 0.450 | 0.003 | 0.247- 0.931 | |
| Poor health care worker attitude | | | | |
| **Lackof insurance** | | | | 0.004 |
| Strongly agree | 1 (Ref) | 1 (Ref) | Ref | |
| Agree | 0.698 | 0.273 | 0.367- 1.327 | |
| Disagree | 0.342 | 0.003 | 0.170- 0,689 | |
| **Lack. Antib. Poli** | | | | 0.001 |
| Strongly agree | 1 (Ref) | 1 (Ref) | Ref | |

| | | | | |
|---|---|---|---|---|
| Agree | 0.949 | 0.868 | 0.503-1.711 | |
| Disagree | 0.393 | 0.003 | 0.211- 0.734 | |
| Lack of antibiotic policy | | | | |

## 4.6 FACTORS AFFECTING SELF-MEDICATION OF ANTIBIOTICS [MULTIVARIATE ANALYSIS]

Table 5 below showed the factors affecting self-medication of antibiotics at the multivariate level of analysis.

### 4.6.1 Long distance to health care facilities

In the multivariate logistic regression analysis, there was statistical significant relationship between self-medication and long distance to the health care facility (HCF) (P=<0.0001), having adjusted for the effects of other factors. The likelihood of self-medication was statistically lower among both those who disagreed that long distance to the HCF could lead to self-medication [AOR=0.065, P=<0.0001, 95%CI (0.020 to 0.213)] and those who agreed that it could lead to self-medication [AOR=0.302, P=<0.0001, 95%CI (0.170 to 0.535)], than the reference group who strongly agreed that long distance could lead to self-medication [AOR=1].

### 4.6.2 Lack of access to health care facilities.

There was also statistical significant relationship between self-medication and lack of access to healthcare facility (P=<0.0001), having controlled for the effects of other factors; the likelihood of self-medication was lower among those who disagreed [AOR=0.239] and who agreed [0.906] that lack of access to HCF could lead to self-medication, than the reference group who strongly agreed that it could lead to self-medication [AOR=1].

### 4.6.3 Non affordability of healthcare services

Additionally, there was statistical significant relationship between self-medication and non-affordability of healthcare services (P=<0.0001), when the effects of other factors were controlled. The likelihood of self-medication was higher among those who agreed [AOR=1.369] and those who disagreed [AOR=1.062] that non-affordability of healthcare services could lead to self-medication, than the reference group who strongly agreed that it could lead to self-medication [AOR=1].

### 4.6.4 Non-availability of heath care facilities

There was statistical significant relationship between self-medication and non-availability of healthcare facility (P=<0.0001), having adjusted for the effects of other factors, and likelihood of self-medication was statistically lower among those who disagreed that non-availability of healthcare facility could lead to self-medication [AOR=0.284, P=0.044, 95% CI (0.083 to 0.965)], but higher among those who agreed that it could lead to self-medication [AOR=1.382], than the reference group who strongly agreed [AOR=1].

### 4.6.5 Lack of drugs in the health care facilities

The relationship between self-medication and lack of drugs in the healthcare facility was statistically significant (P=<0.0001), when the effects of other factors were controlled. However, the likelihood of self-medication was higher among those who agreed [AOR=1.182], but lower among those who disagreed [AOR=0.627] than the reference group who strongly agreed that lack of drugs could lead to self-medication [AOR=1].

### 4.6.6 Lack of health care workers in health care facilities.

The relationship between self-medication and lack of HCWs was also statistically significant (P=<0.0001), having controlled for the effects of other factors; the likelihood of self-medication was higher among those who agreed [AOR=1.240] and lower among those who disagreed [AOR=0.668] than the reference group who strongly agreed that lack of HCWs in healthcare facility could lead to self- medication [AOR=1].

### 4.6.7 Attitude of health care workers

There was also statistical significant relationship between self-medication and the attitude of the HCWs [P=0.0001], having adjusted for the effects of other factors. The likelihood of self-medication was higher among those who disagreed [AOR=1.036] and those who agreed [AOR=1.048], than the reference group who strongly agreed that the attitude of the HCWs could lead to self-medication [AOR=1].

### 4.6.8 Lack of health care insurance policy

Furthermore, there was statistical significant relationship between self-medication and lack of health insurance policy (P=<0.0001), when the effects of other factors were controlled and the likelihood of self-medication was higher among those who agreed [AOR=1.212] and those who disagreed [AOR=1.062] than reference group who strongly agreed that lack of health insurance policy could lead to self-medication [AOR=1].

### 4.6.9 Lack of enforcement of antibiotics policies

Lastly, there was statistical significant relationship between self-medication and lack of enforcement of antibiotic policies (P=<0.0001), having adjusted for the effects of other factors. The likelihood of self-medication was lower among those who disagreed [AOR=0.502] and among those who agreed [AOR=0.963] than the reference group who strongly agreed that lack of enforcement of antibiotic policies could lead to self-medication [AOR=1].

**TABLE 5: FACTORS AFFECTING SELF-MEDICATION OF ANTIBIOTICS [MULTIVARIATE ANALYSIS}**

| Self-medication | AOR | Z p- value | 95% C.I | $Chi^2$ p-value |
|---|---|---|---|---|
| **Long distance** | | | | <0.0001 |
| Strongly agree | 1 (Ref) | Ref | Ref | |
| Agree | 0.302 | <0.0001 | 0.170- 0.535 | |
| Disagree | 0.065 | <0.0001 | 0.199- 0.213 | |
| **Lack. Acc.HCF** | | | | <0.0001 |
| Strongly agree | 1 (Ref) | 1 (Ref) | Ref | |
| Agree | 0.906 | 0.740 | 0.504- 1.626 | |
| Disagree | 0.239 | 0.075 | 0.049-1-555 | |
| Lack of accessibility to healthcare facility | | | | |
| Non afford. HCS | | | | <0.0001 |
| Strongly agree | 1 (Ref) | 1 (Ref) | Ref | |
| Agree | | 0.307 | 0.745- 2.478 | |
| Disagree | | 0.923 | 0.314- 3.494 | |
| Non affordability of health care services | | | | |
| Non avail. HCS | | | | <0.0001 |
| Strongly agree | 1 (Ref) | 1 (Ref) | Ref | |
| Agree | 1.381 | 0.304 | 0.742- 2.571 | |
| Disagree | 0.284 | 0.044 | 0.083-0.964 | |
| Non availability of health care services | | | | |
| **Lack of drugs** | | | | <0.0001 |
| Strongly agree | 1 (Ref) | 1 (Ref) | Ref | |
| Agree | 1.182 | 0.566 | 0.667- 2.094 | |
| Disagree | 0.627 | 0.380 | 0.221- 1.778 | |

| | | | | |
|---|---|---|---|---|
| Lack of HCW | | | | <0.0001 |
| Strongly agree | 1 (Ref) | 1 (Ref) | Ref | |
| Agree | 1.240 | 0.486 | 0.676- 2.273 | |
| Disagree | 0.668 | 0.463 | 0.228- 1.958 | |
| Lack of health care workers | | | | |
| **HCW attitude** | | | | <0.0001 |
| Strongly agree | 1 (Ref) | 1 (Ref) | Ref | |
| Agree | 1.036 | 0.906 | 0.578- 1.857 | |
| Disagree | 1.048 | 0.911 | 0.459- 2.391 | |
| Lack of ins.policy | | | | <0.0001 |
| Strongly agree | 1 (Ref) | 1 (Ref) | Ref | |
| Agree | 1.212 | 0.607 | 0.582- 2.526 | |
| Disagree | 1.062 | 0.894 | 0.437-2.483 | |
| Lack of insurance policy | | | | |
| Lack of anti.policy | | | | <0.0001 |
| Strongly agree | 1 (Ref) | 1 (Ref) | Ref | |
| Agree | 0.963 | 0.113 | 0.488- 1.898 | |
| Disagree | 0.502 | 0.068 | 0.239- 1.052 | |
| Lack of antibiotic policies | | | | |

# CHAPTER FIVE

# DISCUSSION, CONCLUSION AND RECOMMENDATIONS

## 5.0 Introduction

In this chapter the findings of this study were discussed; appropriate comparison with previous similar studies was made, and conclusion was drawn based on the findings and appropriate recommendations made to the relevant authority.

## 5.1 Discussion of the results

The result of this study showed the prevalence rate of self-medication of antibiotics to be high at 73.18%. Similar results were documented by. (Rasheed *et al.*, 2016) in the Riyadh city KSA, Saudi Arabia where the prevalence of self-medication was also high (78.0%); 68% prevalence rate was also reported in the European countries by Bond and Brady in 2017 while much high in the developing countries with a rate going as high as 92% in the adolescents of Kuwait (Shankar et al, 2018) and low prevalence reported in the cross-sectional study for the prevalence of self-medication of antibiotics in northern Tanzania (58.0%) (Horumpende *et al.*, 2016).

Quick relief as reported by 78 participants (27.76%) and no need to visit the doctor for minor illness by 74 participants (26.33%) were the major reasons in favour of their self-medication with antibiotics, others gave: time saving 32 (11.38%), ease and convenience 31 (11.03%), confidence of their knowledge about medicine 26 (9.25%) and learning opportunity more so the students 21 (7.47%).

In the univariate logistic analysis there was no statistical significant relationship between self-medication of antibiotics and gender of participants, but the likelihood of self-medication was lower among the female participants [COR= 0.903] than the male reference participants [COR= 1]. Similar results were reported by (Mohammed *et al.*, 2018). in research done in king Khalid university hospital, Riyadh, Saudi Arabia on the self-medication with antibiotics in the primary health setting, but different finding were reported in Sudan 2018 where female tend to self-medicate with antibiotics more than the male population.

In order of higher tendency for self-medication, age group 26-29 years topped the list followed by 30-35 years, 36-40 years, 41-50 years and age group 51-60 years respectively as the young one tend to be influenced by friends, advertisement and family members.

There was statistical significant relationship between self-medication of antibiotics and the marital status of the participants (P=0.002), and the likelihood of self-medication was statistically lower among the divorced participants [COR=0.374, P=0.012, 95% CI (0.173 to 0.807)] than those who were married [COR=1] and the single participants [COR=1.594], but higher among the single participants than the married one. Similar results were reported in similar study in Lithuania. This could have been attributed by the time factor which divorced participant tend to have to mind much about their health with the fact the they do not hold family responsibilities as the married ones do. The single participants reported a highest prevalence of self-medication because the majority are in the first two predominant age ranges in the self-medication practice of antibiotics, that is to say: 18-24 years and 25-30 years.

The prevalence of self-medication increased with the increase in the educational level as there is a low tendency of self-medication among those with no formal education as they reported lack of knowledge about medicine and risk of using wrong drugs as the major reasons against self-medication of antibiotics unlike those who got formal education more so the tertiary level like the students as they use it as a learning opportunity and the need to have confident on the knowledge about medicine. This is consistent with findings in Lithuania which reported that respondents with low educational status have low prevalence for self-medication of antibiotics as they tend to be less knowledgeable about antibiotics as reported in the American Journal of Infectious Control (Antoun *et al.*, 2018).

There was no statistical significant relationship between self-medication and religion, Similarly, like religion, there was no statistical significant relationship between self-medication and monthly income of the participants, but the likelihood of self-medication was higher among those in the high monthly income levels than those in the low monthly income levels as most reported quick relief, no need to visit a doctor for minor illness and time consuming as the main reasons in favour of their self-medication but lower among those in the middle income probably because they find some time to visit a health care facility since the most are not as busy as those above than those in the very low income level. However, this is not consistent with the finding reported in other countries of Europe such as Slovak republic, Greece and Middle Eastern countries like Jordan

The major source of information was from friends 86 accounting for 30.60% of who were self-medicating with antibiotics, followed by information from the previous prescription 81

(28.83%), family members especially parents or those with some knowledge about medicine was reported by 50 participants (17.79%). This could be because of the trust the respondents had in the friends and family members especially when they have some knowledge about medicine. This is not in line with a similar study done in Jordan that estimated the prevalence of self-medication of antibiotics and evaluated the main reason for self-medication was a positive previous outcome with the antibiotic use and so the main source of antibiotic were the previously prescribed antibiotic (40.12%) (Antoun *et al.*, 2018).

Metronidazole reported by 55 participants (19.57%) was the most self-medicated antibiotic; consistent results were also reported by Horumpende in 2018 and his colleagues in the cross-sectional study in north-eastern Tanzania where metronidazole was the most self-medicated antibiotic. This could be because of its availability over the counter and being mostly prescribed by physicians for many indications that are predominant in the community like for peptic ulcer disease, followed by amoxicillin 36 (12.81%) for cough, cold and sore throat plus also other indications, followed by doxycline 34 (12.10%), ciprofloxacin 32 (11.39%), 31 septrin (11.03%), amoxiclav. 27 (9.61%), penicillin V. 21 (7.47%). These drug were the mostly self-medicated antibiotics in many countries and sometimes were used wrongly to treat common cold and other respiratory infections and also used wrongly as painkillers. Tetracycline was reported by 17 respondents 6.05% of the self-medicating respondents for ocular symptoms especially in the old. The choice of antibiotic from the penicillin group could be due to the following reasons:- they are cheap, easily accessible, have a good safety profile and somehow a broad spectrum of antimicrobial activity (Ewad et al, 2018).

A research done on the self-medication practices among patients attending community pharmacies in Khartoum city by Samah et al in 2018 reported amoxicillin 38% self-medicated either alone or in combination with antibiotics. Simple conditions and therefore no need to see a doctor for minor illness 26% and time saving were also reported to be the major reasons for self-medication which is consistent with the research findings of the reasons in favour of self-medication of antibiotics.

Cough, cold and sore throat was reported by 89 respondents (31.67%) as the indication in favour of their choice, followed by headache, fever and malaria by 69 (17.08%) of participants and 21 (7.47%) for menstrual symptoms while others had multiple indications in favour of self-medication. Similar results were also reported in many studies:

In Greece, a cross-sectional multicentre study conducted to establish the use of antibiotics without prescription, the study results used that despite availability and rapid access to primary care service, the people in Greece tend to self-medicate with antibiotics mostly for common cold and sore throat. The study was in line with our study especially in reference to the use of antibiotic for cough, cold and sore throat as seen above while not in line with our study in reference to the factors affecting the prevalence of self-medication of antibiotics (availability and rapid access to health care facility) which were statistically significant to the prevalence of self-medication of antibiotics in our study unlike that done in Greece.

While in another study on the self-medication practice and associated factors among residents in Wuhan, China showed that the most self-medicated indication was cold and cough and the main reasons were; not severe enough to seek medical advice (45%), no need to see the doctor (12%) and no need to pay high medical cost (15%) (Xioasheng *et al.*, 2018).

Even though the findings of most similar studies vary, one common finding important to note is that the most common indication for antibiotic self-medication was common cold and upper respiratory infections.

The study also found out a statistically significant relationship between prevalence of self-medication and health insurance as respondent reported that if they were having health insurance, they would not be self-medicating with antibiotics. This is inconsistent with results from a similar study done in Mexico which found a negative association between the prevalence of self-medication of antibiotics with private healthcare insurance

**Conclusion**

The study revealed a high prevalence of self-medication with antibiotics (73.13%), which need to be urgently addressed if the anticipated development of microbial resistance, cross-resistance and treatment failure is to be avoided. It showed that age, sex, marital status, level of education, occupation, residence and minimum monthly income affect the prevalence of self-medication with antibiotics. It also showed that moving long distances distance to healthcare facilities, lack of access to healthcare facilities, non-affordability of healthcare services, non-availability of healthcare facilities, lack of drugs in healthcare facilities, lack of healthcare workers in healthcare facilities, lack of health insurance and lack of enforcement of antibiotic policies can make someone engage in self-medication of antibiotics without a prescription.

It showed that metronidazole, amoxicillin, doxycline, ciprofloxacin and penicillin. V. in that order were the most self-medicated antibiotics. Friends advice on antibiotic use and previous prescription used for treatment of similar illness were the most predictors for self-medication with antibiotics. Quick relief of the symptoms of the disease and the thinking of no need to visit the doctor for minor illness were the main reasons for self-medications with antibiotics.

**Recommendations**

Self–medication with antibiotics is considered to be one of the most important issues affecting patients' treatment in hospitals around the country. Intensive health education and promotion campaigns of the harm of self-medication with antibiotics is recommended The use of media, distribution of brochures to highlight the negatives of self-medication and correct use of antibiotics may reduce the prevalence of self-medication with antibiotics

Urgent prospective studies to determine the level of microbial resistance and treatment failure among self-medicated antibiotic users is highly recommended.

Legislation by the Ugandan government strictly banning self-medication will reduce such practise.

And provision of health care insurance to people would be of value to reduce the prevalence.

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## APPENDIX: DATA COLLECTION TOOL USED; QUESTIONNAIRE

The questionnaire is designed to help us understand the prevalence and the factors affecting the prevalence of self-medication. Participation depends on your willingness. No personal information should be written on the paper.

NOTE THAT QUESTIONNAIRES ARE DESIGNED TO ADDRESS THE OBJECTIVES OF THE RESEARCH OR TO GET ANSWERS TO THE RESEARCH QUESTIONS

Please answer legibly.

By either circling or ticking the code: e.g. 1, 2, or 3 etc. of your choice on the question.

QUESTIONS ON:

**A. Demographics**

1. Age: 1 (18-24) 2 (25-29) 3 (30-35) 4 (36-40) 5 (41-50) 6(51-60).
2. Sex: 1 (male) 2 (female)
3. Residence: 1 (urban) 2 (rural)
4. Marital status: 1 (married) 2 (single) 3 (divorced)
5. Level of education: 0 (no formal educ.) 1 (primary) 2 (-secondary) 3 (tertiary) level
6. Occupation: 1 (traditional e.g. farming, house wife) 2 (modern e.g. civil servants, professionals, business) 3. student
7. Religion: 1 (Christianity) 2 (Moslem) 3. Others
8. Monthly Income level: 1 (0-100,000)very low 2 (100,001-200,000)low 3 (200,001-400,000) high 4 (>400,000) very high

**B. self-medication**

1. Have you ever taken antibiotics without prescription in the last one year? 1 YES 0 NO

3. How often did you treat yourself with antibiotics without prescription in the last one year?

1. Always when sick 2. Rarely when sick 3. Sometimes when sick

4 Never when sick

4. Which of the following was the source of information on antibiotics used for self-medication?

1. Friends, 2. Advertisement,

3. Previous prescription, 4. Family members

5. Others, (please specify).....
.....

5. Which of the following antibiotics did you take for self-medication?

1. Amoxycillin
2. Metronidazole
3. Septrin
4. Ciproflaxacin
5. Doxycline
7.Pen. V
8. Others, please specify.....
.....

7. According to you, what were the indications of the antibiotic you self-medicated in the last one year?

1. Headache, fever & malaria
2. Cough cold and sore-throat
3. Stomach ache, vomiting & diarrhoea
4. Menstrual symptoms
5 Ocular symptoms
6 if any other, please specify.....

8. According to you, which of the following were the reasons in favor of your self-medication with antibiotics in the last one year?

1. No need to visit the doctor for minor illness
2. Quick relief
3. Time saving
4. Confidence on your knowledge about medicine
5. Ease and convenience
6. Learning opportunity
7. Crowd avoidance
8. if any other, please specify.....
.....

9. FOR THOSE WHO HAD NEVER SELF-MEDICATED antibiotics, which of the following were the reasons for not self-medicating in the last one year.

1. Lack of knowledge about medicine.
2. Risk of adverse effects.
3. Risk of using the wrong drugs.
4. Risk of misdiagnosing.
5. Risk of drug dependence
6. Risk of using wrong dose of drug.
7 If any other, please specify.....
.....
.....

**C. Factors influencing self-medication with antibiotics**

i. Do you agree that long distance to Health Care (HC) facilities can make you engage in self-medication with antibiotics without prescription when sick?

1 (strongly agreed) 2 (agreed) 3 (disagreed)

ii. Do you agree that lack of access to HC facilities can make you engage in self-medication with antibiotics without prescription when sick?

1 (strongly agreed) 2 (agreed) 3 (disagreed)

iii. Do you agree that non-affordability of HC services can make you engage in self-medication with antibiotics without prescription when sick?

1 (strongly agreed) 2 (agreed) 3 (disagreed)

iv. Do you agree that non-availability of HC facilities can make you engage in self-medication with antibiotics without prescription when sick?

1 (strongly agreed) 2 (agreed) 3 (disagreed)

v. Do you agree that lack of drugs in HC facilities can make you engage in self-medication with antibiotics without prescription when sick?

1 (strongly agreed) 2 (agreed) 3 (disagreed)

vi. Do you agree that lack of health workers in HC facilities can make you engage in self-medication with antibiotics without prescription when sick?

1 (strongly agreed) 2 (agreed) 3 (disagreed)

vii. Do you agree that poor attitude of health workers in HC facilities towards patients can make you engage in self-medication with antibiotics without prescription when sick?

1 (strongly agreed) 2 (agreed) 3 (disagreed)

viii. Do you agree that your lack of health insurance can make you engage in self-medication with antibiotics without prescription when sick?

1 (strongly agreed) 2 (agreed) 3 (disagreed)

ix. Do you agree that lack of enforcement of antibiotic policies contributed in making you engage in self-medication with antibiotics without prescription when sick?

1 (strongly agreed) 2 (agreed) 3 (disagreed)

#### 4.3.7.5 Factors that have influenced students' future career choice from their experience during the degree course

From the bar graph below, majority of the students, 66.3% have been greatly influenced mainly by the course content followed by Industrial training, 51.3% as influences from within their experience during the course of study of the degree and the least was, 29.8% other lectures of pharmacy.

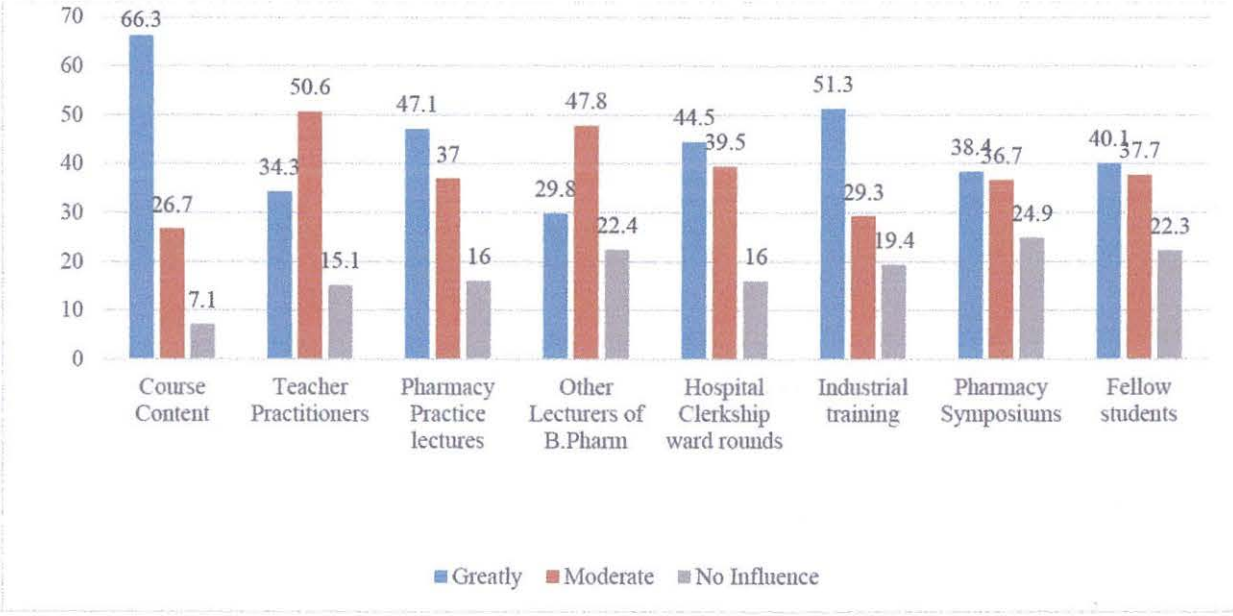


*Figure 6 A bar graph showing how factors from within the course of the study have influenced students future career choices.*

#### 4.3.7.6 Extent to which factors from outside the degree course influenced student's future career choices.

From the graph below, majority (44.6%) of the students were influenced by generally talking to practicing pharmacists while both Company recruitment material and government loan scheme debt tallied at 10% as the least.