PUBLIC PERCEPTION TOWARDS ANTIBIOTIC USE

BY

ESTHER ABUEKIN ALUFOHAI

PHA1405691

DEPARTMENT OF CLINICAL PHARMACY AND PHARMACY PRACTICE

FACULTY OF PHARMACY,

UNIVERSITY OF BENIN

BENIN CITY.

JULY, 2021.

PUBLIC PERCEPTION TOWARDS ANTIBIOTIC USE

BY

ESTHER ABUEKIN ALUFOHAI

PHA1405691

A PROJECT SUBMITTED TO THE DEPARTMENT OF CLINICAL PHARMACY AND PHARMACY PRACTICE

FACULTY OF PHARMACY,

UNIVERSITY OF BENIN,

BENIN CITY.

IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE AWARD OF DOCTOR OF PHARMACY (PHARM. D) DEGREE OF THE

DEPARTMENT OF CLINICAL PHARMACY AND PHARMACY PRACTICE

FACULTY OF PHARMACY,

UNIVERSITY OF BENIN,

BENIN CITY

JULY,2021.

CERTIFICATION

We certify that this is an original research work carried out by Esther Abuekin Alufohai of the Department of Clinical Pharmacy and Pharmacy Practice, Faculty of Pharmacy, University of Benin; in partial fulfillment of the requirements for the award of Doctor of Pharmacy (Pharm. D) degree

Esther Abuekin Alufohai …….

Signature

and Date

Prof. Anthony Waka Udezi …….

Project Supervisor Signature and Date

Dr. (Mrs.) S. F. Usifoh ……

Head of Department Signature and Date

ABSTRACT

Introduction: Antibiotics have played monumental role in the control and management of infectious disease since their discovery, saved lives of countless patients and improved patient care in general. However, antibiotic misuse and unnecessary use of antibiotics contributes to the process of antibiotic resistance, which is considered a global concern.The population plays an important role in abuse or irrational use of antibiotics and spread of bacterial resistance.

Aim of Study: To assess the public perception towards the use of antibiotics.

Methods: A cross sectional 20 - item questionnaire survey involving a convenience sample of 611 individuals was conducted in Benin City and Lagos State. The questionnaire consists of two sections; the first section comprises of socio-demographic data including age, gender, occupational status, educational level, marital status, monthly income. The second section consists of 20 items which collected data about perception towards antibiotics use. Data collected was analyzed using SPSS version 21 and inferential analysis was carried out using GraphPadInstant version 3.10.

Results: From this study, a total of 611 respondents participated out of which 602 questionnaires were completed appropriately therefore giving a high response rate of 98.5%.Those who were students had a higher perception of 69.88 ± 11.60 compared to those who were self-employed (63.52 ± 10.28) while respondents with a tertiary level of education had a better perception (70.37 ± 11.72) compared to those with a secondary level of education or lower. Older respondents had a high perception towards the use of antibiotics however in comparison to more than half of the respondents who were females; male respondents had a better perception towards the use of antibiotics. None of the items loaded had values < 0.4 which indicates their adequate contribution to the summary scores.

Conclusion

This study revealed that occupational status and educational level of respondents was significantly associated with perception towards antibiotic use.

DEDICATION

This work is dedicated to God Almighty who is the author of all wisdom and knowledge and especially to my loving parents whose affection, love and encouragement fuelled my hunger for true education.

ACKNOWLEDGEMENTS

For the Lord gives wisdom, from his mouth comes knowledge and understanding. All thanks to God Almighty for his exceeding abundant grace, guidance, protection in the course of my life and this programme.

I cannot express enough thanks to my Supervisor, Prof. Anthony Waka Udezi who inspire of my shortcomings guided, encouraged and inspired me to appreciate my inner potential in the course of this project. Words won't do enough justice to appreciate your persistence, sacrifices and support towards the success of this project. My profound gratitude to the entire lecturers and staff of the Faculty of Pharmacy, University of Benin for their invaluable skills and knowledge.

My completion of this project could not have been accomplished without the impact of my colleagues and friends, Sochima, Valerie, Hillary, Timothy, Angela, Helen, Blessing, Stephen, Paul, Eti-Ini, Rasheedat, Trust, Nosa, Chuks, Prosper.

To my loving parents, Mr and Mrs Alufohai, your steadfastness and belief has helped me this far. Your legacy will not be forgotten. A very big thank you to Mr and Mrs Aghomon Kennedy, the countless times you've never given up on me shall forever be remembered. Thank you for all your sacrifices.

What would I have done without the love of siblings?. Thank you Francisca, Godwin and Gloria Alufohai for being there at all times.

I also want to express my gratitude to the entire Alufohai and Aghomon family,Daniel, Bello Excel and the entire Bello family, Mmuoegbulem family and others whose names cannot be mentioned because of space limitation. Your impact has been of tremendous help. God bless you.

LIST OF TABLES

Table 4.1: Socio-demographic characteristics of respondents

Table 4.2: Relationship between Age and Mean perception score.

Table 4.3: Relationship between Gender and Mean perception score.

Table 4.4: Relationship between Marital Status and Mean perception score .

Table 4.5: Relationship between Occupational status and Mean perception score .

Table 4.6: Relationship between Educational level and Mean perception score .

Table 4.7: Relationship between Monthly income and Mean perception score .

Table 4.8: Factor Loading and Mean perception score of items.

TABLE OF CONTENTS

CERTIFICATION I

ABSTRACT III

DEDICATION IV

ACKNOWLEDGEMENTS V

LIST OF TABLES VI

TABLE OF CONTENTS VII

1.0 INTRODUCTION 1

1.1 STATEMENT OF THE PROBLEM 2

1.2 OBJECTIVE OF THE STUDY 3

1.2.1 Main Objective 3

1.2.2 Specific Objectives 3

1.3 RELEVANCE OF THE STUDY 3

CHAPTER TWO 5

LITERATURE REVIEW 5

2.0 ANTIBIOTICS AND ITS CLASSES 5

2.1 RATIONAL DRUG USE AND ITS RELATION TO ANTIBIOTICS 6

2.2 CONSEQUENCES OF NOT ACHIEVING RATIONAL DRUG USE 7

2.3 RESISTANCE DEVELOPMENT 8

2.4 SOLUTION TO RESISTANCE DEVELOPMENT 10

CHAPTER 3 11

METHODS 11

3.0 THE SETTING 11

3.1 THE INSTRUMENT 11

3.2 DATA COLLECTION 11

CHAPTER FOUR 13

RESULTS 13

4.0 RESULTS 13

CHAPTER FIVE 20

DISCUSSION AND CONCLUSION 20
5.0 DISSCUSSION 20
5.1 STRENGTHS AND LIMITATIONS 23
REFERENCE 24

CHAPTER ONE

INTRODUCTION

1.0 INTRODUCTION

Antibiotics are substances produced by microorganisms that are antagonistic to the growth of micro-organisms. These are chemicals produced naturally, semi-synthetically or synthetically and function by inhibiting bacterial growth (bacteriostatic) or killing bacteria (bactericidal).

Furthermore, antibiotics have played monumental role in the control and management of infectious diseases since their discovery, as such, their discovery has been hailed as one of the wonders of modern medicine[1] and their use in both preventive and curable therapy have saved life of countless patients and improved patient care in general [2].

Unfortunately, antibiotics are often sold as over-the-counter drugs (OTC) having individuals, then indulge in self –medication, and more often than not, take antibiotics before presentation in the hospital [1].

The factors determining use of antibiotics from the demand side are influenced by several aspects, including: consumers' lack of knowledge about appropriate antibiotic use and its implications, as well as beliefs, expectations and personal experiences with antibiotics [3].

Studies have also shown that patients' knowledge, beliefs, and attitudes, their expectations, and experience with antibiotics have been a contributing factor for spread and emergence of resistant microorganisms. From patients perspective, inappropriate antibiotics use such as failure to complete treatment, skipping of doses, reuse of leftover medicines, misuse of antibiotics in treating viral infections, and self-medication with antibiotics have been reported[4].

These and many other laxities with the use of antibiotics has led to the development of drug resistance[1].

Antibiotic misuse and other types of unnecessary use of antibiotics contribute to accelerate the process of antibiotic resistance, mostly affecting low-and middle-income countries (LMICs) [3].

Antibiotics resistance is a growing global public health challenge that could undo decades of progress in decreasing morbidity and mortality from infectious diseases. Common bacterial pathogens have increasingly developed resistance to most available antibiotics. This phenomenon, coupled with a dry antibiotic pipeline, has led World Health Organisation (WHO) to warn of a "post-antibiotic era, in which common infections and minor injuries can kill" [5].

In Nigeria, the major causes of morbidity and mortality are communicable diseases, and these are generally managed using antimicrobial drugs whose usefulness is being threatened by antimicrobial resistance. Antimicrobials are a cornerstone of disease management in Nigeria and there is a pressing need to discover how best to conserve them [6].

Strategies are therefore needed to effectively address this issue and to avoid the negative consequences of antibiotic misuse [7]. Hence, the World Health Organization Global Action Plan identified five strategies for control of antibiotics resistance out of which includes increasing public awareness and understanding through effective public communication and optimization of antibiotics use in humans. Public health awareness and education on antibiotic use is crucial for the control of the spread of antibiotics resistance because it builds understanding and changes social attitude[8] as the population plays an important role in abuse or irrational use of antibiotics and spread of bacterial resistance[9].

1.1 STATEMENT OF THE PROBLEM

Furthermore, overuse and misuse of antibiotics is often enhanced by access to antibiotics without a physician's prescription, economic factor, lack of knowledge and the unregulated sales and consumption of antibiotics as over the counter medicine in most low and medium income countries[10].

Hence, resulting resistance to antibiotics can cause an extensive increase in costs to the patient and family, the hospital, and society, due to the need for the use of more expensive drugs for second line treatment, more tests and much longer stays in hospital, as

well as longer sick leave, or even premature death. An even greater economic burden lies in the future and will affect generations to come, when the consequences of current use (and misuse) of antibiotics could lead to the loss of all the advantages in medical care that they have brought about. Advanced surgical procedures and cancer chemotherapy might be impossible to perform, resulting in enormous costs, economic as well as human costs. In developing countries where infectious disease is rampant with little medical access and poor regulation, the problem is only expected to be worse[11].

With this in mind, the current perception and habits of the public needs to be understood. Even so, Knowledge, Attitudes, Practices (KAP)-based studies on antibiotic prescribing, consumption, and antibiotic resistance are conducted in different countries on diverse groups, including medical students, university students, health workers, and common public. Thus, continuation of such studies is necessary to understand common cultural beliefs, knowledge gaps, and practice behaviour of a particular social group.

1.2 OBJECTIVE OF THE STUDY

1.2.1 Main Objective

To assess the public perception towards the use of antibiotics

1.2.2 Specific Objectives

- To determine the perception of respondents towards the use of antibiotics.
- To determine the relationship between demographic factors and perception.

1.3 RELEVANCE OF THE STUDY

The public may be aware of antibiotic resistance but they are still unaware on the proper usage of antibiotic. Thus, it is important to assess the knowledge and attitude of public in order to reduce

antibiotic resistance [12]. Awareness studies that evaluate lay knowledge of antibiotics and the factors underlying the unsafe use of antibiotics are considered crucial in order to inform efforts to improve community understanding and best practices in low-resource countries [13].

Identifying predictors of inappropriate antibiotic use could provide important information about the specific knowledge and behaviours to target during the development and implementation of public health interventions and will subsequently promote prudent use of antibiotics in communities [14].

Hence information on the knowledge and attitude of the public can help policy makers, government, antibiotics stewardship committees and international organizations design and initiate educational interventions for patients and the general population aimed at rationalizing the use of antibiotics to combat resistance.

CHAPTER TWO

LITERATURE REVIEW

2.0 ANTIBIOTICS AND ITS CLASSES

Antibiotics are a class of medicinal agents that cover a broad range of infections but do not work against viral infections Etymologically, the word comes from the word anti-biotic and means anti- against and biotic- for life [1]. Antibiotics are either natural substances that are produced in nature by microorganisms or synthetic substances, which have been prepared in the laboratory. To be considered a clinically effective antibiotic and therefore used in medicine, the destruction or growth inhibition of the microorganisms is achieved in the respective concentrations of antibiotics in the body [15].

Antibiotics may be [16]:

i. Broad spectrum which kill many types of bacteria e.g. penicillin of which the broad spectrum antibiotics are active against many types of microbes such as bacteria, rickettsia, mycoplasma, protozoa and spirochetes.
ii. Narrow spectrum which kill certain types of bacteria e.g. isoniazid and they should be used where possible to reduce the risk of colonization and super infection with resistant bacteria. [17]

Additionally, antibiotics are classified based on their invitro activity into;

- Bactericidal- killing the bacteria.
- Bacteriostatic- preventing the growth of the bacteria.

Bactericidal agents include;

- Aminoglycosides: Gentamicin, Tobramycin, Amikacin.
- Beta Lactams (Penicillins, Cephalosporins, Carbapenems):Amoxicillin, Cefazolin, Meropenem.
- Fluoroquinolones: Ciprpfloxacin,, Levofloxacin, Moxifloxacin.

- Glycopeptides: Vancomycin.
- Nitroimidazoles : Metronidazole.

Bacteriostatic agents include;

- Tetracyclines: Doxycycline, Minocycline.
- Lincosamides: Clindamycin
- Macrolides: Erythromycin, Azithromycin, Clarithromycin.
- Oxazolididnediones: Linezolid.
- Sulfonamides; Sulfamethoxazole [18].

2.1 RATIONAL DRUG USE AND ITS RELATION TO ANTIBIOTICS

Antibiotics are the most frequent used drugs in health facilities and they must be used rationally to provide optimal benefits [19]. The rational use of antibiotics although still remains a significant problem in many countries [20-23].

In the first place, rational use of medicines requires that " patients receive medications appropriate to their clinical needs, in doses that meet their own individual requirements, for an adequate period of time, and at the lowest cost to them and their community" [24] and that the process of the rational use of a drug requires a systematic process which involves identifying the problems of patients after getting a correct diagnosis, determining the aim of the treatment and selecting a safety treatment, then beginning the treatment after prescribing the appropriate and presenting the treatment obviously to patients following the results of the treatment and finally evaluating the treatment [25].

With this, the necessity of the rational use of drugs has come to exist because of some problems such as prescribing drugs which are not suitable for current guidebooks or essential drug lists, prescribing drugs which are not suitable for special groups of patients, unnecessary prescribing of expensive drugs [26].

The rational use of antibiotics therefore requires reflection and thought and should be based on rules, the correct diagnosis, the patient's condition, the location of the infection, the severity of the microbial cause sensitivities to antibiotics, the pharmacokinetics and pharmacodynamics of antibiotics, the side effects and cost are the main elements hitch must be supported in every decision for their use [27] .

2.2 CONSEQUENCES OF NOT ACHIEVING RATIONAL DRUG USE

Over the years, the rational use of medicine has come to be regarded as one of the key principles in delivering effective and quality healthcare [28, 29]. Even so, mistakes related to the use of drugs termed as irrational use of drugs including buying drugs without consulting a physician, using drugs that are available at home, using drugs with references of others, using drugs in wrong doses, finishing the treatment before the suggested date, asking for injectable form of the drug and requesting physicians to prescribe unnecessary drugs are seen commonly [30, 31].

Antibiotics that have been used for nearly 50-60 years heavily contribute to human health for treating infectious diseases which could be mortal. With the help of rational use of antibiotics, becoming chronic diseases has been inhibited for a number of infectious diseases and the resistance or severity of diseases has been limited. However, it is seen that the irrational use of antibiotics has increased day to day rather than those goals. As a result of unnecessary and misusing of antibiotics, there is a resistance against antimicrobial factors and it causes financial losses beside negative effect for human health [32].

The irrational use of drugs may be originated because of both the effects of health personals and the factors that are related to patients. For whatever reason, irrational use of drug causes disorder for human health and economic losses. [33]. For instance, in USA, there has been an increase at the rate of 4% to 6% on admission to hospital that has been based on adverse effects of drugs. Additionally, it was seen that approximately the irrational use of drugs caused 30- 130 million dollars of costs on mortality and morbidity [34]. The irrational use of drugs can also cause unsuccessful treatments, resistance for antibiotics, repeated diseases or long-period health problems, unsuitable patients demands that are the results of overused drugs, problems on

supplying drugs because of the decreases in drug stocks, drug dependency and the increase in the price of treatment [35, 36].

Globally, drug resistance causes an estimated 700,000 deaths each year. If current trends continue, it is projected that, by 2050, Antimicrobial resistance (AMR) could result in over 10 million deaths per year and over 100 trillion USD in lost output globally[37].

2.3 RESISTANCE DEVELOPMENT

Antibiotic resistance was reported to occur when a drug loses its ability to inhibit bacterial growth effectively. Bacteria become 'resistant' and continue to multiply in the presence of therapeutic levels of the antibiotics [3]. Antibiotics fight to eliminate bacteria. Hence, bacteria tend to have a natural process that encourages resistance. The resistance process occurs via gene level mutations [4].

Antibiotics are usually effective against them, but when the microbes become less sensitive or resistant, it requires a higher than the normal concentration of the same drug to have an effect [2].

Bacteria possess the quality to directly transfer genetic material between each other by transferring plasmids, which signifies that natural selection is not the only mechanism by which resistance evolves [8]. A single antibiotic may not only select resistance to one particular drug. Resistance can occur with other structurally related compounds of the same class. For example, resistance to tetracycline may incur resistance to oxytetracycline, chlortetracycline, doxycycline, and minocycline [38].

User-related factors such as self-medication, noncompliance, misinformation, and advertising pressures in combination with other factors such as ignorance, lack of education, and inaccessibility to health care and diagnostic facilities, are the major drivers of resistance. Poverty compounds the problems, because patients do not have access to clean water and hygiene and are at an increased risk of acquiring infections. Individuals living in poverty also have poor baseline nutritional status to fight off infections and are at risk of treatment termination due to

affordability issues. Other factors relating to health-care providers that may lead to inappropriate prescribing include insufficient training, unprofessional conduct, and paucity of diagnostic facilities, leading to incorrect selection of antibiotics. Inappropriate prescriptions resulting from economic incentives offered by pharmaceutical companies and unaffordability of appropriate dose and duration of antibiotic regimens perpetuate a vicious circle of suboptimum treatment leading to antimicrobial resistance [4]

Health care-associated infections are drivers of the resistant pandemic and can seed resistant organisms into the community where they become widespread. The risk of acquisition of HCAI is 2-20 times higher in developing countries such as Nigeria. Common examples of HCAIs are blood stream infections, surgical site infections and urinary tract infections. Furthermore, a systematic review in Nigeria found marked resistance to all drugs commonly prescribed for urinary tract infections in the country. There are high rates of resistance to ceftriaxone, ampicillin and cotrimoxazole. Most organisms demonstrated 100% resistance to ampicillin and cotrimoxazole which have long been used as first line drugs in the treatment of UTI.

According to Nigeria's legislation, antimicrobials and other antibacterial should only be dispensed with prescription. However, a combination of factors ranging from a shortage of licensed prescribers and medicines in some areas, to proliferation of under-regulated patent medicine vendors and hawkers in others, means that Nigeria suffers severe access problems whilst simultaneously facing a crisis of irrational drug use.

Much antimicrobial use and misuse is driven by patients, and the general populace who demand antimicrobials for real or presumed infections and procure them from unsanctioned sources even when they are not prescribed. Awareness of AMR is low among Nigerians in general, even among the health professionals.

Resistance is therefore accelerated by selection pressure from inappropriate antimicrobial use while the spread of resistant organisms from one person to another is promoted by poor infection prevention and control. A balance must be maintained where antimicrobials are optimally available but with limited access to unwarranted use [6].

2.4 SOLUTION TO RESISTANCE DEVELOPMENT

The World Health Organization (WHO) is coordinating a global campaign to raise awareness of antibiotic resistance and encourage best practices among the public, policy makers, health and agriculture professionals, to avoid further emergence and spread of antibiotic resistance. Part of the activities of the Global Action Plan (GAP) to tackle the growing challenge of antimicrobial resistance is to improve global awareness and understanding of AMR through effective communication, education and training [37].

A holistic approach to tackle the menace of AMR will involve steps taken at all levels of society (public, policy makers, health and agriculture professionals) to reduce the impact and limit the spread of resistance. The general public can also play a key role by taking actions to prevent infections to avoid the need for antibiotics and using antibiotics only when prescribed by a certified health professional. Other remedial actions will include; always taking the full prescription, never using left-over antibiotics and never sharing antibiotics with others [39].

One of the key areas in the control of antibiotic resistance is a change in the behaviour of consumers and providers of antibiotics. Major resistance control strategies therefore recommend education of the public to promote appropriate antibiotic use. the type and nature, as well as the extent of education to be given to the public, will depend on the kind of population to be addressed at any point in time. The kind of education needed by medical doctors and people with some knowledge of medical sciences will be different from that needed by individuals who do not have any background in the medical sciences. Also that of individuals with a formal education or basic education without a degree will be different from that of completely illiterate consumers of antibiotics [38].

CHAPTER 3

METHODS

3.0 THE SETTING

A cross sectional questionnaire based study of perception towards antibiotic use and resistance was conducted among convenience sample residing in Isolo Local Government, Lagos State and in University of Benin, Ugbowo campus, Benin City. The study sample consisted of adult subjects which comprises of residents in an industrial layout and students of the University of Benin, Benin City respectively.

3.1 THE INSTRUMENT

A standard questionnaire was the main research instrument and it was designed to get an overview of respondents perception towards antibiotic use and resistance .The questionnaire consists of two sections; the first section comprise the demographic data such as the respondent's age ,gender, occupation, marital status, educational level, monthly income. The second section consists of 20 items which collected data concerning perception to antibiotics in the form of a Likert scale where 5=strongly agree, 4=agree, 3=Not sure, 2= disagree, 1= strongly disagree. Some of the items that make up the instruments were reversed to prevent false response (see appendix for questionnaire used in the survey).

3.2 DATA COLLECTION

The data was collected from the convenient samples. The sample population was made up of individuals who responded within the last one year of antibiotic usage. Participation was anonymous and voluntary of which data was collected from respondents who gave their consents after the purpose of the study was explained. Respondents were encouraged to voluntarily participate in the study. The questionnaire was administered to respondents and submission was on the same day of administration.

3.3 DATA ANALYSIS

Prior to data analysis, all filled questionnaires were evaluated for completeness and the questionnaires found usable were coded and entered into Microsoft Excel 2007 and crosschecked for accuracy for descriptive statistics. Summary scores of the items were calculated (such that the higher the score, the more favourable the perception of antibiotics) along with their standard deviation. Perception categories were determined according to the summary score (60). The reliability of the questionnaire was assessed by calculating Cronbach alpha with the aid of SPSS version 21.Inferential analysis was done (student t-test and One way ANOVA as appropriate) with the aid of Graph Pad Instat 3.0 that reports exact p-value. Logistics regression was performed to show the association between socio- demographic factors and perception towards antibiotic use. All p values less than 0.05 were considered significant

CHAPTER FOUR

RESULTS

4.0 RESULTS

A total of six hundred and eleven (611) respondents participated in the study out of which 9 questionnaires were excluded due to incomplete and missing information giving a response rate of 98.5%.

A summary of the socio-demographic characteristics of the sample population is represented in table 4.1 below. More than half of the population were females and majority of the respondents were less than or equals to 25 years of age. Majority of the respondents were single (84.53%) with about 70% of the respondents students and about 21% of the respondents self-employed. About 46% of respondents had a monthly income of #20,000 and 27% within #20,000- #40,000 , 26% respondents had a monthly income greater than #40,000.

Table 4.1: Socio-demographic characteristics of respondents

Age	Frequency	Percentage(%)
≤25	429	71.26
26-35	120	19.93

≥36	53	8.80
Gender		
Male	235	39.17
Female	365	60.83
Marital status		
Single	508	84.53
Married	87	14.48
Others	6	0.99
Occupation		
Student	425	70.72
Self employed	129	21.46
Government/Private worker	47	7.82
Educational Level		
≤ Secondary	103	17.49
Tertiary	444	75.34
Post Graduate	42	7.20
Income		
<20,000	208	46.74
20,000 -40,000	121	27.20
>40,000	116	26.07

The next results show no significant difference between respondent's ages and mean perception score. However, respondents' >36 years had the highest mean perception score of 68.96.

Table 4.2: Relationship between Age and Mean Perception score.

Age	Frequency	Mean Perception score ± SD
≤ 25	429	68.24 ±11.96
26- 35	120	68.37 ±12.25
≥36	53	68.96±9.99

P value =0.9160

From the table below, no significant difference was found between the male respondents and the female respondents in relation to mean perception score. However, male respondents had a higher score of 69.30

Table 4.3 Relationship between Gender and mean perception score

Gender	Frequency	Mean Perception score ±SD
Male	235	69.30 ± 12.40
Female	365	67.67 ± 11.48

P value =0.1005

It appears from the next table that there is no significant difference in the relationship between Marital Status of respondents and the mean perception score with a P value of 0.3358. See Table 4.4 below.

Table 4.4 Relationship between Marital Status and Mean perception score

Marital Status	Frequency	Mean Perception score ±SD
Single	508	68.52± 12.11
Married	87	67.19 ± 10.57
Others	6	69.0±7.35

P value= 0.3358

Table 4.5 below shows the relationship between occupation and mean perception score of respondents The results of the study shows that respondent's occupation was a major contributor to perception of antibiotics use and resistance as self-employed respondents had a mean perception score of 63.52, students (69.88) and Government/Private workers (67.38) at a P value < 0.001 which is considered significant.

Table 4.5: Relationship between Occupation and Mean perception score.

Occupation	Frequency	Mean Perception score ± SD
Student	425	69.88 ±11.60
Self- Employed	129	63.52 ±10.28

Government/ Private worker	47	67.38±14.48

P value < 0.0001

Table 4.6 shows the relationship between educational level of respondents and the mean perception score of which respondents who attained only secondary level and below had the lowest score of 60.17 with tertiary level having a highest mean score of 70.37 at a P value of <0.001 which is considered significant

Table 4.6: Relationship between Educational level and Mean perception score

Educational Level	Frequency	Mean Perception score ± SD
≤ Secondary	102	60.17 ±10.39
Tertiary	440	70.37 ± 11.72
Post Graduate	42	68.45±7.74

P value< 0.0001.

From Table 4.7 below, it appears that respondents with a monthly income N20,000 -N40, 000 had a high mean perception score of 71.01 and other respondents had a relative score of 68.64 and 67.70 of which no significant difference was found at a P value of 0.0937.

Table 4.7 Relationship between Monthly Income and Mean perception score

Monthly Income	Frequency	Mean Perception score ± SD
<20,000	208	68.64 ±12.11
20,000 -40,000	121	71.01 ± 12.70

>40,000	116	67.70±12.23
P value =0.0937		

The Results of table 4.8 shows that each component contributes adequately to the summary perception score with a factor lading value of not < 0.4.

Table 4.8 Factor loading and mean perception score of items

	Items	Factor Loading	Mean Perception score ±SD
	Component 1		
5	The same antibiotics can be used in the future for the same infection without prescription	0.400	3.27 ± 1.26
14	I use left-over antibiotics in cases of repeated illnesses	0.674	3.42 ± 1.28
15	My mother has a major influence on the use of my antibiotics	0.428	3.29 ± 1.28
16.	I prefer to use the same antibiotics that has worked well in the past	0.604	2.28 ± 1.15
17	If my family member is ill, I give my prescribed antibiotics to them	0.612	3.37 ± 1.27
18	I keep antibiotics at home in case of need or emergency	0.67	2.69 ± 1.26
20	I use antibiotics without prescription	0.620	3.54 ± 1.26
	Mean Total ± SD Total = 3.27±1.25		
	Component 2		
1	It is appropriate to take antibiotics without proper medical examination	0.686	3.98± 1.02
2	It is ideal to take twice the dose in case of missed dose	0.754	4.19± 0.86

6	The proper dosage of antibiotics can be increased if there is no symptomatic improvement without consulting a healthcare practitioner	0.561	4.08 ± 0.91
7	Antibiotics should be used for all mild illnesses	0.570	3.76 ±1.04
11	I expect antibiotics to be given for all illnesses	0.511	3.77 ± 1.07
	Mean total ± SD Total=3.96±0.98		
	Component 3		
3	The prescribed dose of antibiotics can be terminated if symptoms improve	0.783	3.46 ±1.26
4	The duration of antibiotics can be terminated if symptoms improve	0.813	3.47 ± 1.26
	Mean Total± SD Total = 3.46±1.26		
	Component 4		
8	Frequent unnecessary use of antibiotics can lead to increased rate of resistance	0.831	3.82 ± 1.22
9	Skipping antibiotics contributes to antibiotics misuse	0.826	3.80 ± 1.11
	Mean Total± SD Total= 3.81±1.16		
	Component 5		
10	Antibiotics are effective for diarrhoea, cold and cough	0.725	2.72 ± 1.13
	Mean Total ± SD Total =2.72 ± 1.13		
	Component 6		
12	Easy access to antibiotics contributes to my frequent use	0.686	2.96 ±1.24
13	To conserve cost, I purchase half or less of the recommended quantity	0.449	3.75± 1.16
19	I complete antibiotics treatment even after getting better	0.511	3.76 ± 1.21
	Mean Total ± SD Total = 3.49 ± 1.20		

P value total <0.0001

CHAPTER FIVE

DISCUSSION AND CONCLUSION

5.0 DISSCUSSION

There is a need to tackle antibiotic resistance emergence and containment on levels ranging from individuals, households, and the communities, to health care facilities, the entire health sector, and finally to national and global levels[40].

The aim of this study was to assess the perception of the public as regards antibiotic use and resistance

The present findings would aid in providing quantitative data of patterns of antibiotics use, perceptions regarding antibiotics among Nigeria citizens. This will aid in the assessment of the adequacy of the present community educational campaigns on antibiotics, and provide further insight in designing future multifaceted interventions targeting specific areas to promote rational

antibiotic use, and replenish the knowledge and attitude gaps as an effort against antibiotic resistance.

Overall, the respondents in our study had a relatively good perception towards antibiotic use with a general mean perception score of 68.3. About 39% of the respondents which comprised of males had a higher mean perception score (69.30) than females (67.67).There was a similar result in a study carried out in Bangladesh [41]and Nigeria[39]. Although this findings had no significant difference (p value =0.10) with regards to perception towards antibiotic use, studies among Norwegian pharmacy customers showed that being a male had a negative association [42] while other studies [12, 39, 41, 43-44] were in line with the results of the study showing no association between Gender and perception towards antibiotic use.

In this study, respondents aged 36 years and above had relatively high mean perception score (68.96) compared to ages 26-35 (68.37) and 25 years and below (68.24). Thus indicating that the older population had greater perception towards antibiotic use. This findings were contrasting with previous studies that found greater perception in younger age[45]. No significant association between age and perception towards antibiotic use was found in this study. This finding concurred with a similar study carried out in Shah Alam, Malaysia[12] while contrasting results was found in a similar study carried out in Ghana and Vietnam where results from the surveys showed that knowledge about the prudent use of antibiotics increased with age [45., 46].

With regards to marital status of respondents, 0.9 % respondents (individuals who were either divorced or widowed) had higher perception score (69.0) than 84% (students, 68.5) and 14% (married, 67.1). This finding also showed no association between Marital Status of respondents and the perception towards antibiotic use. To the best of our knowledge, studies have not been carried out to determine the association between Marital Status and perception towards antibiotic use.

A lot of studies have proved that individuals with higher level of education have much knowledge, attitude, practices and perception towards antibiotic use compared to people with low level of education [39, 42,45, 47-49]. Our findings were in line as it gave a significant result in the relationship between educational levels of respondents towards antibiotic use where as

seen in Table 4.6, respondents with tertiary level of education who constituted about 75% of respondents had a high perception score of 70.37 as compared to other 25% respondents. Notably, respondents with only a secondary level of education or lower had a lower perception score (60.17) than other respondents. Significant difference (p value< 0.001) was found between the education level of respondents and perception towards antibiotic use . This association was seen in other studies carried out in Sweden, Norwegia, Romania, Serbia [11, 42, 9, 50].

More so, the occupational status of respondents showed a significant association in relation to perception towards antibiotic use. Respondents who were students had a higher perception score towards antibiotic use, this finding in agreement with survey results from Bangladesh [41]. On the other hand, Government / Private company workers had a better perception in a study carried out in Cameroon with self-employed respondents having low scores [51]. Our findings further revealed that self-employed respondents also had relatively low perception score towards to antibiotics use, therefore this group of individuals can be targeted during educational campaigns. Significant association was found with occupational status and perception towards antibiotic use.

It is of note that none of the items loaded had values less than 0.4 thereby indicating their adequate contribution to the summary perception scores.

While findings from Mozambique have reported greater perception with increased monthly income [52], our findings showed that respondents with a monthly income of N20,000- N40,000 had the highest perception than others. Findings also in Sri Lanka [43] and Nigeria [39] were in line with our results that showed that monthly income has no significant association with perception towards antibiotic use.

Majority of the respondents earn less than 100 USD implying an income of less than 3.30USD per day. This finding supports the report by the Nigeria Centre for Disease Control (NCDC), stating that majority of the Nigerian populace survive on or under 3.10USD per day. The report of the Antimicrobial resistance (AMR) situation analysis which was done in collaboration with

the Federal Ministry of Agriculture, Environment and Health went further to identify poverty as the major contributor to the health challenges in Nigeria [6].

A number of implications flow from our findings. Our study provides an evidence base from which to develop education programmes for the community about antibiotic use. The concept of antibiotic resistance is known but problems associated with antibiotic misuse were found to be imperfectly understood as such primary health care doctors or health workers could provide education to community members, and mass education campaigns such as the use of TV, Radio, Newspaper), workshops and social media where applicable conducted to emphasise the potential risks of resistance by using non-prescription antibiotics and the inappropriateness of using antibiotic therapy for minor ailments.

The study also identified a relationship between respondents having less perception regarding the appropriate use of antibiotics. Our findings showed that females had relatively low perception in regard to antibiotic use. In most developing countries, including Nigeria, females hold the responsibility of taking care of their children and other family members, thus their better practices should contribute to some extent to the control of antimicrobial resistance. Groups, such as those with lower formal education, who had less perception to antibiotic use and females could be targeted in education campaigns. Notably as 70% of the respondents were students, introducing short courses or workshops can positively impact on rational use of antibiotics. Education of community members alone will not be enough to minimise any misuse of antibiotics. A multi-faceted approach involving policy makers, prescribers, and the general public using both educational and regulatory measures is needed. Such measures should be embedded in a general policy to change the culture of antibiotic use by improving awareness among the general public and professionals about the risks associated with antibiotic use as well as reducing public misconceptions about the benefit of taking antibiotics for minor illnesses.

5.1 STRENGTHS AND LIMITATIONS

Strength of this study is the high response rate (98.5) which demonstrated representative results minimising possible bias. However, it was conducted in Benin City and Lagos State as such results from this study are more generalizable in these districts.

The use of self-report could have introduced potential bias into the study; however anonymous participation was ensured to minimize socially desirable answers. This study like most questionnaire-based study faced other limitations due to respondent's bias in which case some of the respondents felt the need to give a "correct" answer instead of a sincere response.

Despite these limitations, the present study provides important findings for beneficial for public health policy makers in Nigeria.

5.2 CONCLUSION

This research provides useful information on the current perception towards antibiotic use in a sample of Nigerians.. Results from this study showed that there is a significant association between educational level and occupational status of respondents and perception towards antibiotic use.

REFERENCE

1. Okechukwu, Chioma. (2020). Rational Use of antibiotics – A Point Prevalence Study carried out in a Tertiary Hospital in South-South Nigeria. International Journal of Tropical Disease and Health. 41. 39-47. 10.9734/IJTDH/2020/v41i1430352.
2. L. J. V. Piddock, "The crisis of no new antibiotics-what is the way forward?" The Lancet Infectious Diseases,vol.12,no.3,pp. 249–253, 2012.

3. Cambasco, O., Alonso Menendez, Y., Kinsman, J. *et al.* Community knowledge and practices regarding antibiotic use in rural Mozambique: where is the starting point for prevention of antibiotic resistance?. *BMC Public Health* **20,** 1183 (2020).
4. Laxminarayan R, Duse A, Wattal C, Zaidi AK, Wertheim HF, Sumpradit N, Vlieghe E, Hara GL, Gould IM, Goossens H, Greko C, So AD, Bigdeli M, Tomson G, Woodhouse W, Ombaka E, Peralta AQ, Qamar FN, Mir F, Kariuki S, Bhutta ZA, Coates A, Bergstrom R, Wright GD, Brown ED, Cars O. Antibiotic resistance-the need for global solutions. Lancet Infect Dis. 2013 Dec;13(12):1057-98. doi: 10.1016/S1473-3099(13)70318-9. Epub 2013 Nov 17.
5. WHO. Antimicrobial resistance: global report on surveillance 2014. http://www.who.int/drugresistance/documents/surveillancereport/ en/ (accessed May 4, 2014).
6. Nigeria Centre for Disease Control (NCDC), Federal Ministries of Agriculture, Environment and Health. Antimicrobial Use and Resistance in Nigeria: situation analysis and recommendations. 2017.
7. World Health Organization. Medicines: rational use of medicines. Fact sheet N◦338; 2010.
8. World Health Organization (WHO). Antimicrobial resistance: Global Action Plan on Antimicrobial Resistance; 2015. Geneva [accessed June 20, 2017].
9. Voidăzan S, Moldovan G, Voidăzan L, Zazgyva A, Moldovan H. Knowledge, Attitudes And Practices Regarding The Use Of Antibiotics. Study On The General Population Of Mureş County, Romania. Infect Drug Resist. 2019 Oct 31;12:3385-3396. doi: 10.2147/IDR.S214574. PMID: 31802918; PMCID: PMC6827501.
10. Akinyandenu O, Akinyandenu A. Irrational use and non-prescription sale of antibiotics in Nigeria: A need for change. Journal of Scientific and Innovative Research. 2014;3(2):251-257.
11. M. Andr´e, A. Vernby, J. Berg, and C. S. Lundborg, "A survey of public knowledge and awareness related to antibiotic use and resistance in Sweden," Journal of Antimicrobial Chemotherapy, vol. 65, no. 6, pp. 1292–1296, 2010.
12. Knowledge and Attitude Towards Antibiotic Usage Among General Public in Shah Alam, Malaysia. Pharmaceutical and Bioscience Journal.

13. Radyowijati A, Haak H. Determinants of antimicrobial use in the Developing World. Child Health Research Project Special Report. 2002;4(1).
14. Effah, C.Y., Amoah, A.N., Liu, H. *et al.* A population-base survey on knowledge, attitude and awareness of the general public on antibiotic use and resistance. *Antimicrob Resist Infect Control* **9,** 105 (2020).
15. losifidi H(2013) Relationship of consumption of antimicrobial resistance in a third-hospital hospital.Study of the effect of therapeutic intervention instructions. Aristotle University of Thessaloniki, Thessaloniki, Greece
16. Marcelos M (2006) Medical Pharmacology Teaching notes. University of Ioarinina, Greece.
17. Kousoulakos X, Fragoula Kis B [2007] The Drug Market in Greece, Annual Report 2007. Health Insurance Observatory, Athens, Greece.
18. Nemeth J, Oesch G, Kuster SP. Bacteriostatic versus bacteriocidal antibiotics for patients with serious bacterial infections: Systematic review and meta-analysis. J. Antimicrobial Chemotherapy. 2015 Feb; 70(2) : 382-95. [PubMed].
19. World Health Organization. Community based surveillance of antimicrobial use and resistance in resource constrainedsetting. Geneva: World Health Organization; 2009.Available from: http://www.who.int/entity/medicines/publications/community based may09.pdf [accessed28.04.13]
20. Hadi M, Duerink DO, Lestari ES, Nagelkerke NJ, Werter S,Keuter M, et al. Survey of antibiotic use of individuals visiting public health care facilities in Indonesia. Int J InfectDis 2008;12:622—9.
21. Desalegn AA. Assessment of drug use pattern using WHO prescribing indicators at Hawassa University teaching and referral hospital, south Ethiopia: a cross-sectional study. BMC Health Serv Res 2013;13:170—6.
22. Dong L, Hong Y, Wang D. Drug prescribing indicators in village health clinics. Fam Pract 2011;28:63—7. Avail-able from: http://fampra.oxfordjournals.org [accessed09.03.12].
23. Soulsby EJ. Resistance to antimicrobials in humans and animals. BMJ 2005;331:1219—20.12

24. World Health Organization. Medicines: rational use of medicines. Fact sheet N◦338; 2010. Available from: http://www.who.int/mediacentre/factsheets/fs338/en/index.htm l [accessed 28.04.13].
25. Berild D., Ringertz S. H., Lelek M. and Fosse B. (2001) Antibiotic Guidelines Lead to Reductions in the Use and Cost of Antibiotics in a University Hospital. Scandinavian Journal of Infectious Diseases 33 (1): 63-67
26. Yalçın Balçık, P., Selvi Sarıgül, S. (2019). The Rational Use of Drug and Antibiotics. Hacettepe Sağlık İdaresi Dergisi, 22(3): 695-709.
27. Kotsiftopoulos C, Kourkouta L, Papageorgiou M (2014) The use of antibiotic medicine. Monograph, Lap Lambert Academic Publishing, Saarbrucken, Germany.
28. Gopalakrishnan S., Udayshankar P.M., Rama R. Standard treatment guidelines in primary healthcare practice. J. Fam. Med. Prim. Care. 2014;3:424–429. doi: 10.4103/2249-4863.148134
29. Management Sciences for Health . MDS-3-Managing Access to Medicines and Health Technologies. Management Sciences for Health (MSHl); Arlington, VA, USA: 2012.
30. Sürmelioğlu N., Kıroğlu O., Erdoğdu T. ve Karataş Y. (2015) Akılcı Olmayan İlaç Kullanımını Önlemeye Yönelik Tedbirler. Arşiv Kaynak Tarama Dergisi 24(4): 452462.
31. Pınar N. (2012) Ülkemizde İlaç Harcamaları. İnönü Üniversitesi Tıp Fakültesi Dergisi 19(1): 59-65.
32. Öztürk R. (2008) Akılcı Antibiyotik Kullanımı ve Ülkemizde Antimikrobik Maddelere Direnç Sorunu. İ. Ü. Cerrahpaşa Tıp Fakültesi Sürekli Tıp Eğitimi Etkinlikleri Toplumdan Edinilmiş Enfeksiyonlara Pratik Yaklaşımlar Sempozyum Dizisi 61: 116.
33. WHO (1985) Conference of Experts on the Rational Use of Drugs. World Health Organization, Geneva.
34. The Rational Drug Use National Action Plan (2014-2017)
35. Tuncer Ö., Yavuz H., Akbaş O., Bayındır A. G., Işıl A. M. and Yüksel A. (2016) Hastaların Akılcı İlaç Kullanımına İlişkin Yaklaşımları: Kesitsel Çalışma. İzmir Eğitim ve Araştırma Hastanesi Tıp Dergisi 20(4): 123-129.

36. Aksoy M., Alkan A. and İşli F. (2015) Sağlık Bakanlığı'nın Akılcı İlaç Kullanımını Yaygınlaştırma Faaliyetleri. Türkiye Klinikleri Pharmacology - Special Topics 3 (1): 19-26.
37. Africa Center for Disease Control. Africa CDC framework for antimicrobial resistance, 2018-2023. 2018.
38. Igbeneghu, Oluwatoyin. (2013). Knowledge and practices in the use of antibiotics among a group of Nigerian university students. International Journal of Infection Control 9: i1 doi: 10.3396/ijic.v9i1.007.13. International Journal of Infection Control. 10.3396/ijic.v9i1.007.13.
39. Chukwu, Emelda & Oladele, David & Awoderu, Oluwatoyin & Afocha, Ebelechukwu & Lawal, Rahman & Abdus-salam, Ismail & Ogunsola, Folasade & Audu, Rosemary. (2020). A national survey of public awareness of antimicrobial resistance in Nigeria. Antimicrobial Resistance & Infection Control. 9. 10.1186/s13756-020-00739-0.
40. Tomson G, Vlad I. The need to look at antibiotic resistance from a health systems perspective. *Ups J Med Sci*. 2014;119(2):117–124. doi:10.3109/03009734.2014.902879.
41. Marzan, Mahfuza & Islam, Dewan & Lugova, Halyna & s.krishnapillai, Ambigga & Haque, Mainul & Islam, Salequl. (2021). Original Article: Knowledge, Attitudes, and Practices of Antimicrobial Uses and Resistance Among Public University Students in Bangladesh. Infection and Drug Resistance. 14. 519-53. 10.2147/IDR.S289964.
42. Waaseth, M., Adan, A., Røen, I.L. *et al.*Knowledge of antibiotics and antibiotic resistance among Norwegian pharmacy customers – a cross-sectional study. *BMC Public Health* **19,** 66 (2019)'
43. Gunawardhana, Chaminie & Sakeena, M.H.F. & Sivayoganthan, C.. (2015). Awareness of Rational Medication Use and Antibiotic Self- Medication Practices among Undergraduate Students in a University in Sri Lanka. Tropical Journal of Pharmaceutical Research. 14. 723-729. 10.4314/tjpr.v14i4.23.
44. Nepal, A., Hendrie, D., Robinson, S. *et al.*Knowledge, attitudes and practices relating to antibiotic use among community members of the Rupandehi District in Nepal.*BMC Public Health* **19,** 1558 (2019).

45. Jimah T, Ogunseitan O .Socio-demographic data characteristics of the association between knowledge of antibiotic therapy and prudent use in Ghana. *Journal of Global Health Reports,*2020.4:e2020034.
46. Thuy Van Ha, An Mai Thi Nguyen, Ha Song Thi Nguyen, "Public Awareness about Antibiotic Use and Resistance among Residents in Highland Areas of Vietnam", *BioMed Research International,* vol. 2019, Article ID 9398536, 8 pages, 2019.
47. Auta, Asa & Bandar, SB & Shalkur, David & Dangiwa, Dauda & Ogbole, Esther & Tor-Anyiin, Amom. (2014). Antibiotic Use in Some Nigerian Communities: Knowledge and Attitudes of Consumers. Tropical Journal of Pharmaceutical Research. 12. 1087. 10.4314/tjpr.v12i6.33.
48. Voidăzan S, Moldovan G, Voidăzan L, Zazgyva A, Moldovan H. Knowledge, Attitudes And Practices Regarding The Use Of Antibiotics. Study On The General Population Of Mureş County, Romania. Infect Drug Resist. 2019 Oct 31;12:3385-3396. doi: 10.2147/IDR.S214574. PMID: 31802918; PMCID: PMC6827501.
49. NapolitanoF,IzzoMT,DiGG,Ang7elilloIF.Public knowledge, attitudes, and experience regarding the use of antibiotics in Italy. PLoS One.2013; 8: e84177.
50. Horvat OJ, Tomas AD, Paut Kusturica MM, Savkov AV, Bukumirić DU, Tomić ZS, Sabo AJ. Is the level of knowledge a predictor of rational antibiotic use in Serbia? PLoS One. 2017 Jul 10;12(7):e0180799. doi: 10.1371/journal.pone.0180799. PMID: 28700631; PMCID: PMC5507268.
51. Elong Ekambi G-A, Okalla Ebongue C, Penda IC, Nnanga Nga E, Mpondo Mpondo E, Eboumbou Moukoko CE (2019) Knowledge, practices and attitudes on antibiotics use in Cameroon: Self-medication and prescription survey among children, adolescents and adults in private pharmacies. PLoS ONE 14(2): e0212875. doi:10.1371/journal.pone.0212875.
52. Mate I, Come CE, Gonc¸alves MP, Cliff J, Gudo ES (2019) Knowledge, attitudes and practices regarding antibiotic use in Maputo City, Mozambique. PLoS ONE 14(8): e0221452. https:// doi.org/10.1371/journal.pone.0221452.

APPENDIX

QUESTIONNAIRE TO DETERMINE THE PUBLIC PERCEPTION TOWARDS THE USE OF ANTIBIOTICS.

The questionnaire is for research purpose and the data provided will remain confidential. The questions assesses the public perception towards antibiotics use .

Age:≤ 25 ☐ 26-35 ☐ 36-45 ☐ ≥46 ☐

Sex: Male ☐ Female ☐

Marital status: Single ☐ Married ☐ Divorced ☐ Widowed ☐

Occupation: Student ☐ Government worker ☐ Self employed ☐ Private company worker ☐ Retired ☐

Education level: Primary ☐ Secondary ☐ Tertiary ☐ Postgraduate ☐

Monthly income [₦]: <20000 ☐ 20001-40000 ☐ 40001-60000 ☐ 60001-80000 ☐ 80001-100000 ☐ >100000 ☐

FOR THE FOLLOWING QUESTIONS,TICK THE APPROPRIATE BOX BASED ON YOUR LEVEL OF AGREEMENT

S/N	STATEMENTS	STRONGLY AGREE	AGREE	NOT SURE	DISAGREE	STRONGLY DISAGREE
1	It is appropriate to take antibiotics without proper medical examination					

2	It is ideal to take twice the dose in case of missed dose					
3	The prescribed dose of antibiotics can be terminated if symptoms improve					
4	The duration of antibiotics can be terminated if symptoms improve					

5	The same antibiotics can be used in the future for the same infection without prescription.					
6	The proper dosage of antibiotics can be increased if there is no symptomatic improvement without consulting a healthcare practitioner					
7	Antibiotics should be used for all mild illnesses					
8	Frequent unnecessary use of antibiotics can lead to increased rate of resistance					
9	Skipping antibiotics contributes to antibiotics misuse					
10	Antibiotics are effective for diarrhoea, cold, cough					
11	I expect antibiotics to be given for all illnesses					

12	Easy access to antibiotics contributes to my frequent use					
13	To conserve cost, I purchase half or less of the recommended quantity					
14	I use left-over antibiotics in cases of repeated illnesses					
15	My mother has a major influence on the use of my antibiotics					
16	I prefer to use the same antibiotics that has worked well in the past					
17	If my family member is ill, I give my prescribed antibiotics to them					
18	I keep antibiotics at home in case of any need or emergency					
19	I complete antibiotics treatment even after getting better					
20	I use antibiotics without prescription					