

Attitude, Knowledge, and Use of Self-Medication with Antibiotics by Outpatients of Gbagada General Hospital Gbagada Lagos.

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Abstract

Self-medication with antibiotics is a threat to global health and becoming increasingly common due to multiple factors. The aim of our study was to evaluate the attitudes, knowledge, and use of self-medication with antibiotics among outpatients of Gbagada General Hospital Gbagada – Lagos, Nigeria. The objective of this research was to access the attitudes, knowledge and use among the Patients that use Self-medication with antibiotics. The study design was a cross-sectional descriptive study. A pretest of a closed-ended questionnaire was distributed to the respondents, corrections were made, and data was collected in February 2021. 402 Outpatients of the Gbagada General Hospital Gbagada city area of Lagos was recruited for the study in the aforementioned time period through multi-stage probability sampling. Thirty-three percent of respondents said antibiotics could cure all infections. Forty-eight percent of respondents said antibiotics might be effective even if they don't complete their dosage. 94.78% of our respondents have taken antibiotics, and 71.89% have self-medicated with antibiotics. Forty-eight percent of respondents said antibiotics might be effective even if they don't complete their dosage, Not completing the dosage (49.25%), Using antibiotics repeatedly (43.28%), and Self – medication (34.08%). The percentage of the respondent that have taken antibiotics once and twice between March 2020 and February 2021, which was during the COVID – 19 First and second wave in Nigeria, were (36.07%) and (25.87%) respectively. We recommend the use of media to discourage the masses from self-medication with antibiotics.

Keywords: Antimicrobial resistance, Antibiotics, Self – medication.

Introduction

Self-medication with antibiotics is a threat to global health and becoming increasingly common due to multiple factors. Self-medication as defined by WHO is the utilization of drugs to treat self-diagnosed disorders or symptoms, or the irregular or continuous use of a prescribed drug for chronic or repeated diseases or symptoms without Doctor's description [1].

The absence of clinical assessment of the condition by a qualified medical doctor is a result to self-medication, which could result in overlooked diagnosis and hindrances in appropriate treatments [2]. The research discovered that the Chemotherapy of bacterial

infections depends on the isolation of the aberrant agent, categorization of the agent's antibiotic susceptibility, and bringing the suitable antibiotic to the site of infection in adequate quantities to either kill the bacteria (bactericidal) or modify it to allow the body's immune response to drug and eventually kill it [3]. Previous researchers defined self-medication defined as “taking of drugs, herbs or home remedies on one's own initiative, or on the advice of another person, without consulting a doctor” [4]. This procedure includes the use of medication by oneself or giving it to family members, friends, colleagues, including children or the elderly [5]. Previous literature revealed that the prevalence of self-medication is comparatively greater in

developing countries as compared to developed countries [6, 7]. The researchers also found out that regions of Eastern and Southern Europe had comparatively higher rates of self-medication than northern and western areas of Europe [7].

The prevalence was 3% in northern Europe [7]. An increase in self-medication practices has also been observed in Latin America [8]. While there is a huge increase in Asia, with the values being reported to be around 4-75% [9]. A previous study carried out in Karachi discovered that the self-medication rate in university students was 80.4% and that in the urban population was 68.1% [10, 11].

Two decades ago, the World Health Organization (WHO) encouraged the use of self-medication without medical council in order to prevent and treat diseases in a faster and more efficient manner and also to reduce the load on healthcare centers in the rural areas [12, 13]. The recent WHO reports on antimicrobial resistance states that it is a current global health threat [1]. It has been discovered that the use of medicines has led to problems in the short and long term. Self-medication is becoming increasingly common due to multiple factors. With information easily accessed through the internet, people are exposed to a greater amount of information, and they want to make independent decisions regarding their lives, which includes medications too [14]. Another important reason is the increased access to antibiotics in countries like Nigeria, where they are sold without a prescription, giving people a chance to ignore the Doctor and use their own opinion or the advice of others to self-medicate [15-18]. The causes of increased use of self-medication with antibiotics are because of an attitude of medical/health care providers, financial problems, illiteracy, inadequate healthcare facilities, or even a lack of time [12]. Studies carried out in Argentina, Brazil, Chile, Colombia, Costa Rica, and Nicaragua linked the high self-medication rates to a lack of access to healthcare facilities [8].

Another interesting discovering in Honduras was that self-medication was connected to urban dwellers. However, no association was built with socio-economic status [19].

Individuals indulging in the act of using antibiotics do not have adequate information regarding their proper use, dosage, and any side effects [20, 21]. Abuse of such drugs may cause harm to the patients. There is a perception amongst the masses that common respiratory infections can be cured by antibiotics [22]. This has led to increased uninstructed use of antibiotics that has resulted in many pathogens becoming resistant to them. Strains of *S. pneumonia*, *S. Typhi*, *Neisseria gonorrhoeae*, and *Shigella* species have been found that are now resistant to common antibiotics [23-26]. [27] also found a direct relationship between inappropriate drug use and antibiotic resistance. In Pakistan, pharmacies are under a legal requirement to sell specific drugs only on prescription from a registered medical professional [28, 29]. However, the adherence to the law by these pharmacies is not encouraging, resulting to the high rates of self-medication [28, 30]. In Lome, Togo, pharmacies do not sell any drug without Doctor's prescription.

In the research conducted in Nigeria by [31] out of the 1230 respondents from undergraduate students and community members, prescription of antibiotics by a physician was 33% and 57%, respectively, amongst undergraduate students and community members. The researchers tested the respondent's knowledge of antibiotic resistance (ABR) and found that undergraduate students displayed less knowledge that self-medication could lead to ABR (32.6% and 42.2%, respectively).

The study also discovered that self-medication with antibiotics is highly prevalent in Northwest Nigeria, with most medicines being purchased from un-licensed stores without a prescription from a physician. This is very rampant in Nigeria as Pharmacies have no regulation or restriction of the sale of drugs.

[31] also observed a significant gap in respondents' knowledge of ABR.

Research Questions for this Study

Does the individuals indulging in the act of using antibiotics do not have adequate information regarding their proper use, dosage, and any side effects. What are the multiple factors that lead to or result to increase of Self – medication with antibiotics?

Assumptions

The assumption in this study is that there is the probability of self-medication with antibiotics, the effectiveness of antibiotics, lack of knowledge, and cost that leads to increased self-medication with antibiotics.

However, due to the high economic cost of hospital care, lack of time to visit the hospital, and often personal beliefs, and the fear of going to the hospital after-effects like contracting diseases like COVID - 19, people usually regard Doctor's clinical assessment and prescription as a voluntary rather than compulsive measure.

Hypothesis

Lack of knowledge of awareness of antibiotics resistance and high cost gives rise to Self – medication with antibiotics, and there may be other multiple factors or significant determinants that are difficult to measure and quantify, which determine causes of Self – medication with antibiotics.

Aim

The aim of our study was to evaluate the attitudes, knowledge, and use of self-medication with antibiotics among outpatients of Gbagada General Hospital Gbagada – Lagos, Nigeria.

Specific Objectives

- a) To examine the level of knowledge and use of antibiotics among outpatients of Gbagada General Hospital Gbagada – Lagos

- b) To find out the frequency and reasons of Self – medication with antibiotics among outpatients of Gbagada General Hospital Gbagada – Lagos
- c) To assess the adverse effects in the outpatients that use Self – medication with antibiotics
- d) To examine the association of socio-cultural factors with antibiotics use.

Literature Review

According to [32], 39.3% had practiced Self-medication with antibiotics (SMA). The main reason for taking antibiotics is for runny nose, nasal congestion, cough, sore throat, fever, aches and pains, vomiting, diarrhea, and skin wounds. There was no significant difference between the medical or non-medical students regarding whether they had ever taken antibiotics ($p=0.082$), but a significantly higher percentage of non-medical students had self-medicated with antibiotics compared to medical students ($p<0.001$). Responses from another research conducted by [31] discovered that the undergraduate students identified that the commonly self-diagnosed illnesses treated with antibiotics were malaria (14.5%), typhoid (13.1%), stomach pains (12.7%), diarrhea (11.9%), cold (0.8%), ear and throat pain (1.2%), asthma (1.6%), sinusitis (2.2%), dental caries (2.8%), and fever (3.9%). On the other hand, the community members were more likely to use antibiotics for illnesses such as dysentery (19%), infection (17%), typhoid (13%), sinusitis (1.8%), asthma (2.2%), food poisoning (3.1%), and ear and throat pain (3.2%) [31]. Another research discovered that Antibiotics were used to treat self-perceived sore throat, fever, pain, cough, vaginal discharge, eye problems, common influenza, urinary infections, respiratory tract infections, wounds, and toothaches [33].

The frequency of SMA taken by medical students have significantly lower than the non-medical students with a Chi-square of $p<0.001$ the significant differences regarding reasons for

SMA between medical and non-medical students [31]. The research [31] discovered that the frequency of antibiotic used among undergraduate students and community members were reported as 43% and 26% weekly, respectively. Undergraduate students were more likely to use antibiotics as reported in the weekly usage of antibiotics (43%) compared to community members (26%).

Another research found out that antibiotics were purchased by referring to the scientific or generic name, which was one of the most common patterns of SMA used by the participants from the middle and high socio-economic pharmacies. The names of antibiotics were known by the participants since most indicated previous use of, prescribed by a health care professional (HCP) when they had sought help at the hospital or clinic. The researchers discovered that participants who requested an antibiotic using a previous prescription pattern named amoxicillin with clavulanic acid, azithromycin, and cotrimoxazole as the most purchased NPA. They also found out that the participants did not know precisely the uses and adverse effects of the requested antibiotics; they believed that the antibiotics were useful in treating certain diseases in 2 to 3 days. [34].

In the research [34], the majority of the pharmacy clients interviewed, 30 (93.75%) admitted frequent use of Non prescribed antibiotics (NPAs), 15 (88.2%) out of the 17 pharmacists interviewed admitted dispensing NPAs [34]. While the majority of the participants (16) mentioned the use of amoxicillin, also known as 'two colours medicine', 14 participants mentioned the use of cotrimoxazole, and seven mentioned amoxicillin with clavulanic acid. Two to five participants also used tetracycline, ciprofloxacin, azithromycin, doxycycline, erythromycin, metronidazole, and phenoxymethylpenicillin [34]. The researchers questioned the manner customers request NPA, pharmacists unanimously admitted that SMA is

a frequent practice among customers. Another pharmacist admitted SMA is a widespread and rampant practice and that most customers seem to be very well informed [34]. [31] also discovered that the distribution pattern of most commonly used antibiotics among undergraduate students were metronidazole (18%), amoxicillin/clavulanic acid (16.8%), ampicillin/cloxacillin (14.8%), cotrimoxazole (12%), and tetracycline (11%). Meanwhile, the community members reported the highest use of ampicillin/cloxacillin (23.5%), ciprofloxacin (18.7%), ampicillin (12.5%), tetracycline (11.4%), and amoxicillin/clavulanic acid (10.6%). %).

[32] found out that most practiced SMA because of its Convenience (42.3%) [Medical (41.7%) and non-medical students (42.5%)] or cost savings [Medical (37.5%) and non-medical students (35.2%)], though not much difference, were seen between both groups. Differences were found relating to lack of trust in the prescribing doctors as one of the reasons for SMA, where none of the medical students had a lack of trust in their prescribing doctors as compared to non-medical students (8.9%). Furthermore, more non-medical students gave "other reasons" as their reason (9.5%), while more medical students gave multiple answers to these questions (16.7%). However, there was no significant difference between the medical and non-medical students regarding the diseases, the basis for SMA, nor the reasons they stopped antibiotics during SMA ($p=0.052$, 0.428 , and 0.684 , respectively). The common disease or condition for SMA was due to fever (25.5%); SMA was mainly practiced based on a previous doctor's prescription (35.9%), and the majority stopped the antibiotics once their symptoms disappeared (31.2%). No medical students stated a lack of trust in prescribing doctors, whereas (8.9%) non-medical students stated that was a reason for SMA (Chi-square $p=0.005$).

[32] found out that the main decision for choosing amoxicillin during SMA as the type

of antibiotics (37.1%); obtaining their antibiotics from community pharmacies was (66.0%); knowing the dosage after consulting a doctor was (27.8%) and taking only one type of antibiotic during an illness was (55.1%). Haque discovered that, there was no significant difference between medical and non-medical students regarding the dosage and the maximum number of antibiotics taken during an illness. However, significant differences were observed between the two groups regarding the consideration for SMA and where they obtained the antibiotics for SMA [32]. A higher percentage of medical students gave either multiple answers or the brand and price of the antibiotics as their main consideration compared to non-medical students, who were more concerned about the type or an adverse reaction from the antibiotics [32].

[32] also found out that practices regarding the use of antibiotics during SMA, very few participants “always” change the dosage or switch antibiotics during SMA were 8.1%, though quite a number “sometimes” did were 41.3%. The majority that did not fully understand the instruction on the antibiotic package were 60.2%, and somewhat concerned about taking counterfeit antibiotics were 46.4%, the respondents that did not experience any adverse effects during SMA were 71.3%, those that thought that SMA was an acceptable practice were 61.3% and those that were not sure whether they could successfully treat the infection on their own were 64.3%. Less than half of the participants had taken the same antibiotics with different names during a course of antibiotics (40.1%).

[32] did a comparison between medical and non-medical students regarding the use of antibiotics with SMA showed a significant difference for understanding the instruction on the antibiotics package, whereas as expected, a higher percentage of medical students understood the instruction fully ($p=0.015$). In addition, a higher percentage of medical students switched antibiotics during SMA

($p=0.004$) and did not think that they could successfully treat themselves ($p=0.011$). A higher percentage of non-medical students were more concerned about taking counterfeit antibiotics ($p=0.011$) and thinking that SMA is a good or acceptable practice ($p=0.002$) [32].

A study conducted by [31] found out that prescription of antibiotics for use by a clinician, nurse, or pharmacist were 33.5%, 29%, and 25%, respectively, among undergraduate students and were 57%, 20.4%, and 15.5% among the community members. It was discovered that antibiotics purchases mostly took place at patent medicine stores (40%) among the undergraduate students, unlike the community members whose main source of Purchase was at a local chemist or pharmacy (48.4%). However, a substantial number of the undergraduate students compared to community members reported that they patronized local drug hawkers (22.7% and 9.4%, respectively). Regarding compliance with the prescribed duration of use of the antibiotics indicated that 85% of undergraduate students and 84% of community members completed the course of antibiotic prescription. Similarly, the majority of the respondents (72.5% undergraduate students and 60.4% community members) suggested that antibiotic use was devoid of any side effects. In contrast, respondents reported different levels of satisfaction from the use of antibiotics. Undergraduate students mostly rated antibiotic use as good (43%), while the community members mostly rated it as satisfactory (40%) in resolving illnesses. The chi-square tests indicate a significant association between frequency of antibiotic use, prescribing personnel, place of Purchase, and efficacy of antibiotics in resolving illnesses with self-medication with antibiotics among the undergraduate students and community residents (p -value < 0.001) [31].

In the research conducted by [33] found out that the pharmacists observed that most customers knew exactly the name and dosage of the antibiotics (how many milligrams, e.g. If

250 mg or 500 mg), and occasionally, they referred to the name of the laboratory of origin of the antibiotics if a German, Portuguese or Indian-made antibiotics. [34].

[34] discovered that pharmacists agree SMA is an individual practice, they were of the opinion that the doctors and/or qualified health professionals were also to blame for the widespread abuse of the use of antibiotics since they are quick to prescribe for symptoms or health problems that do not necessarily require antibiotics treatment.

Moreover, pharmacists believed doctors' prescribing practices contributed to SMA since they frequently prescribe the same antibiotic for different conditions, and patients learn to recognize those antibiotics. This, according to pharmacists, led patients to overuse and didn't feel the need to seek medical help since patients who can afford to pay go straight to the pharmacy. [34]

The study also highlighted that both customers and pharmacists mentioned the practice of sharing antibiotics with family, friends, and/or other people from the social network are common. Such behavior was, according to the pharmacists, influenced by the behavior of not finishing the complete course of treatment and/or stopping medications when symptoms disappear. This attitude led patients to do home storage of left-over antibiotics that are later used either for the same patient or others within the social network or family. Participants from FGD, customers, and a pharmacist agreed and explained [34]. From the study, pharmacists admitted with concern that some customers used old prescriptions to purchase antibiotics.

According to the pharmacists, it is also becoming common for customers to come with an old prescription as a picture saved in their smartphone or even shared by someone else. Normally old patients, people above 60 years old, use a lot of old prescriptions. People also got information from the internet without Doctor's prescription. [34].

Methodology

Study Design

A descriptive cross-sectional study was carried out to assess the knowledge, use, frequency, and reasons of self-medication with antibiotics among patients at Gbagada General Hospital Gbagada from February 14th – 19th, 2021. Gbagada General Hospital is the largest tertiary care hospital run by the government. It is one of the major suppliers of free-of-cost healthcare for the community of Gbagada for patients who cannot afford to pay for their treatment. Four hundred people were recruited from the Outpatient Department (OPD) of the hospital. This study was approved by the review board of Lagos state health service commission and Lagos University Teaching Hospital Health Research Committee.

Study Area

This study was conducted in Kosofe Local Government Area in Lagos State, Nigeria. Kosofe means "nothing is free". This underscores the diverse commercial activities which characterized the indigenes and early settlers of the area in the mid-nineteenth century, the people were noted for massive trade in vegetables, fruits, maize, cassava, and fish. Its location at the gateway to the metropolitan Lagos further entrenches Kosofe as an important name in commerce in modern-day Nigeria [35].

Kosofe is located at the Northern part of Lagos State. It is bounded by (3) other Local Governments, namely: Ikeja, Ikorodu, and Somolu. It also shares a boundary with Ogun State. Its jurisdiction comprises of seven wards and encompasses an area of about 17.85sq/km. Its headquarters is at Ogudu Road, Ojota, Lagos; presently, Kosofe falls under the East Senatorial District [35].

Self-medication with antibiotics occurs everywhere in the world, including Kosofe Local government. Where our research was conducted (General Hospital Gbagada) was a

good place to study and capture the knowledge and use of self-medication with antibiotics.

Study population

The population comprised of all the residents in Kosofe LGA, and study subjects were outpatients that use General Hospital. This comprised of those that use self-medication with antibiotics, as well as track the adverse effects in the patients that used self-medication with antibiotics.

Inclusion Criteria

Outpatient Department (OPD) of Gbagada General Hospital Gbagada Lagos. The definition of self-medication was set as the use of any antibiotics within the last 12 months, without the prescription of a doctor. This time limit of 12 months was set to eliminate the possible recall bias among the participants. Antibiotics are the medications consumed to treat bacterial and protozoal infections and that are depicted on the World Health Organization's (WHO) model list of necessary medicines [36] [37]

Exclusion Criteria

Outpatient Department (OPD) that do not use General Hospital.

Sample Size Determination

The Cochran formula is [38] - The sample size was determined in order to have 95% confidence limits of 5% maximum error of the estimate when the probability is 46% [30]. This leads to a requirement of 402 residents. For a non-response expectation, the sample size was increased to 402 Outpatient Department (OPD) of the hospital. 402 Outpatients of the Gbagada General Hospital Gbagada city area of Lagos will be recruited for the study in the aforementioned time period through probability sampling.

Sampling Technique

The technique of multi-stage sampling was used to obtain cross-sectional data for this study

in Lagos state. The Lagos state was divided geographically into 37 Local governments Area.

Stage 1: The balloting method of simple random sampling was used to select a government hospital (Gbagada general Hospital) from the list of hospitals in the Local governments of Lagos state, Nigeria. Therefore, the sample sizes of 402 outpatients were distributed according to the number of patients that use a government hospital.

Stage 2: Simple random sampling method using outpatient registers was used to select the patients that would be sampled in the hospital.

Stage 3: All outpatients using self-medication with antibiotics in the hospitals were sampled in the hospital picked.

Method of Data Collection

Informed consent was obtained from every participant, both verbal and written. Questionnaire was developed for this study based on the previous research questions related to knowledge and use of self-medication with antibiotics. A pretest was carried out for 20 outpatients of Gbagada General Hospital, and necessary modifications were carried out. Participants were given the option of answering the questionnaire themselves or having the researcher fill it based on verbal responses. The questionnaire contained five sections. The first is the demographic section, which contained questions regarding age, gender, marital status, education level, household income, occupation, and health insurance. Section B assessed the different antibiotics that the participants bought for self-administration. Section C gauged the reasons for self-medication and its frequency, the location for obtaining medicines, and the people they approached for advice. Section D determined the knowledge of adverse effects caused by antibiotics. Section E asked about the knowledge of inadequate use of antibiotics on antibiotic resistance. The investigator explained the study to the participants, including the conditions for participating, as well as privacy

and confidentiality for data collection. Although the study was free from any serious ethical issues, the researcher designed a participant's information sheet that explained the voluntary nature of the study in details, and the anonymity and confidentiality in the study. Necessary translation of the contents of the tools for this research was done to assist the less-learned but with care not to influence or distort the judgment of the participants. The researcher, through trained health workers for data collection, gave the participant's information sheet and questionnaire to eligible and willing participants at the various places designated for data collection.

Ethical Considerations

Ethical approval was obtained from the Research and Ethics Committee of Lagos University Teaching Hospital. Permission was also obtained and the Chairman of Lagos State Health service commission before the commencement of the study. Participation was voluntary; all the participants were required to provide written informed consent, and they were assured of the confidentiality regarding information collected from them.

Section A was the demographic section, which will contain questions regarding age, gender, marital status, education level,

Section A: Socio-Demographic Data

household income, occupation, and health insurance. Section B assessed the different antibiotics that the participants bought for self-administration. Section C was gauged the reasons for self-medication and its frequency, the location for obtaining medicines, and the people they approached for advice. Section D was determined the knowledge of adverse effects caused by antibiotics. Section E asked about the knowledge of inadequate use of antibiotics on antibiotic resistance. Each participant was asked at the start of the questionnaire whether they self-medicated. Those who did were required to fill the whole questionnaire while the rest only filled sections A, D and E. The questionnaire was compiled from the already validated versions used by [37, 39, 40] in their studies.

Results

This section presents the major findings from the study. The results are divided into five sub-sections, namely: Socio-demographic characteristics of respondents, The different antibiotics that the participants bought for self-administration, The reasons for self-medication and its frequency, the location for obtaining medicines, and the people they approached for advice and the knowledge of adverse effects caused by antibiotics.

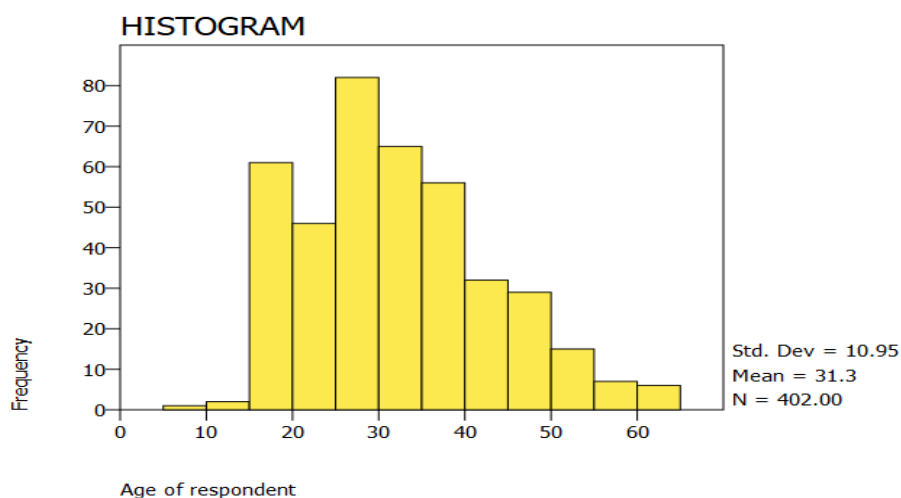


Figure 1. Socio-Demographic Data

The mean, modal ages, and standard deviation of respondents, were 31.29 years, 30 years old, and 10.95. The youngest respondent was 8 years old, and the oldest respondent was 64.

Table 1. Socio-demographic Characteristics of Respondents

Respondents	Frequency n = 402	Percentage (%)
Have you ever taken antibiotics?		
Yes	381	94.78
No	21	5.22
Have you treated yourself (self-medicated) with antibiotics?		
Yes	289	71.89
No	113	5.22
Sex of respondent		
Male	155	38.56
Female	247	61.44
Marital Status		
Single	204	50.75
Married	180	44.78
Divorced	9	2.24
Separated	9	2.24
Education		
No formal education	2	0.50
Primary	5	1.24
Secondary	129	32.09
Tertiary	266	66.17
Religion		
Christian	307	76.37
Islam	95	23.63
Others	0	0.00
Employment Status		
Employed	156	38.81
Unemployed	101	25.12
Self employed	145	36.07
Income		
<50,000 Naira	193	48.01
50,000 – 99,999	72	17.91
100,000 – 150,000	81	20.15
>150,000	56	13.93
Health Insurance status		
Yes	136	33.83
No	266	66.17

Respondents that are females were 61.44%, and 38.56% were males. Half of our respondents were single (50.75%) while 44.78% were married, 2.24% were divorced and separated, respectively.

The majority of parents/guardians were Christians (76.37%), Muslims were 23.63%. The respondents (parents/guardians) interviewed that had secondary education were 33.09%, 66.17% had tertiary education, while 1.24% had primary education and 0.50% had no formal education.

The majority of our respondents were employed (38.81%), about 36.07% of our respondents were Self - employed 25.12% of our respondents were unemployed. It was interesting to discover that 48.01% of our respondents earn below 50,000 Naira monthly, 17.91% earn between 50,000 naira, and 99,999

naira monthly, 20.15% earn between 100,000 – 150,000 naira monthly, and 13.93% earn above 150,000 Naira monthly respectively.

The majority of respondents (66.17%) do not have health insurance, while only 33.83% of respondents have health insurance, 94.78% of our respondents have taken antibiotics, while 5.22% have not taken antibiotics before.

The majority of our respondents (71.89%) have self-medicated with antibiotics, while 28.11% do not self-medicate with antibiotics.

Section B: The Different Antibiotics that the Participants Bought for Self-administration

Ampicillin (53.23%), Penicillin (51,24%), chloroquine (45.77%), and Amoxicillin (40.05%) are the antibiotics our respondents used most for Self – medication.

Section C: The Reasons for Self-medication and its Frequency, the Location for Obtaining Medicines and the People they Approached for Advice

Table 2. The Reasons for Self-medication and its Frequency, the Location for Obtaining Medicines

Reasons	Frequency n = 402	Percentage (%)
What is your frequency of antibiotics use?		
Weekly	18	4.48
Monthly	44	10.95
Once in two months	41	10.20
Every 3 months	48	11.94
Others	251	62.44
Who prescribed the antibiotics?		
Doctor	170	42.29
Nurse	51	12.69
Pharmacist	139	34.58
Others	42	10.45
Place of antibiotics purchase		
Local Chemist	186	46.27
Patent Medicine store	168	41.79
Local drug hawkers	4	1.00
Others	44	10.95
Did you comply with the duration of use of antibiotics?		
Yes	319	79.35
No	83	20.65
Were there any side effects?		
Yes	145	36.07

No	257	63.93
Was the antibiotics effective in resolving the illness?		
Excellent	158	39.30
Satisfactory	175	43.53
Good	61	15.17
No results	8	1.99
How much did you understand the instructions?		
Fully understood	292	72.64
Partly understood	100	24.88
Did not understand at all	10	2.49
Have you ever found out that you had taken the same antibiotics with different names at the same time?		
Yes	133	33.08
No	269	66.92
Have you ever had adverse reaction when you took antibiotics for Self - medication?		
Yes	91	22.64
No	311	77.36

For frequency of antibiotics use majority of our respondents fall in the category of others (62.44%). Doctor's and Pharmacist prescription for our respondents was 42.29% and 34.58%, respectively. It is worthy to note that some patient calls their health care providers on the phone or use telemedicine which has come to stay.

The place of Purchase of antibiotics our respondents use for Self – medication were Local chemist (46.27%) and Patent Medicine stores (41.79%). It was amazing that 79.35% of our respondents complied with the duration of the use of the antibiotics, which is good, and 63.93% of our respondents reported that they had no side effects while 36.07% had side effects.

Surprisingly, 98.01% of our respondents stated that the antibiotics was effective to resolving their illness. Our respondents indicated that 36.07% and 25.87% have taken antibiotics once and twice, respectively, between March 2020 and February 2021, which was during the COVID – 19 First and second wave in Nigeria. It is worthy to note 11.69% didn't take antibiotics in the last one year, and an 8-years-old child took antibiotics 24 times

within one year because of a medical history of infection in the leg. (Bone joint).

Long delays in hospital (43.03%), Convenience (26.37%), Cost saving (20.90%), and attitude of hospital staff (18.16%) were mostly the reasons our respondents were self-medicating with antibiotics. Our respondents self-medicated with antibiotics for Infection (40.55%), Fever (38.31%), Sore throat (27.36%), Cough (26.62%), Malaria (26.12%), Typhoid (19.40%), Diarrhea (16.92%), Aches and pains (16.67%).

Respondent's selections of antibiotics were based on Recommendation by a Doctor (41.29%), Based on my own experience and knowledge of antibiotics (30.85%), recommendation by community Pharmacist (28.36%), Previous Doctor's prescription (23.13%), and recommendation by Nurse (16.42%). Our respondents that Fully understood the instruction of the antibiotics they used to self-medicate were 72.64%.

The majority of our respondents (77.11%) took only one type of antibiotics when they were ill, 19.25% took two types of antibiotics, while 2.99% took three types of antibiotics, and only 0.25 took four types of antibiotics.

Our respondents that found out that they had taken the same antibiotics with different names at the same time were 33.08%.

Our respondents stopped taking antibiotics after completion of the course (35.82%), a few days after recovery (30.85%), After symptoms disappeared (29.60%), while 9.45% stopped after antibiotics finished/ran out, 7.46% stopped

after a few days regardless of the outcome. Our respondents that had an adverse reaction when they self-medicate with antibiotics were 22.64%, and 11.94% stopped taking antibiotics when they experienced an adverse reaction, while 9.20% and 4.98% consulted a Doctor and Pharmacy staff, respectively.

Section D: The Knowledge of Adverse Effects Caused by Antibiotics and Section E: The Knowledge of Inadequate use of Antibiotics on Antibiotic Resistance

Table 3. The Knowledge of Adverse Effects Caused by Antibiotics and the Knowledge of Inadequate use of Antibiotics on Antibiotic Resistance

Section D:	Frequency n = 402	Percentage (%)
Do you know what antibiotics are?		
Yes	360	89.55
No	42	10.45
Antibiotics can cure all infections		
True	132	32.59
False	271	67.41
Antibiotics might be effective even if I don't complete my dosage		
Yes	194	48.26
No	208	51.74
Level of awareness of antibiotics resistance		
Low	79	19.65
Moderate	257	63.93
High	66	16.42
Do you use left-over antibiotics from friends and family members without Doctor's prescription?		
Always	13	3.23
Sometimes	147	36.57
Never	242	60.20
Section E:		
Do you use another family members antibiotics?		
Always	17	4.23
Sometimes	127	31.59
Never	258	64.18
Unnecessary use of antibiotics makes them ineffective		
True	277	68.91
False	125	31.09
Have you heard of resistance to antibiotics?		
Yes	205	51.00
No	197	49.00

Respondents knew what antibiotics are were 89.55% while 32.59% of our respondents said

antibiotics can cure all infections, and 48.26% of our respondents said antibiotics might be

effective even if they don't complete their dosage. Level of awareness of antibiotic resistance amongst our respondents for were moderate (66.93%), Low (19.65%), and High (16.42%).

Respondents that use left-over antibiotics from friends and family members without Doctor's prescription sometimes and always were 36.57% and 3.23%, respectively.

The common adverse reaction of antibiotics experienced by respondents were Nausea (26.87%), Rash (24.13%), Vomiting (13.68%), Drug resistance (12.19, Diarrhea (11.19%), and Vaginal thrush 93.235).

Our respondents said that Intravenous is better than oral medication (27.36%), Higher doses result in faster recovery (15.67%), Lower doses result in less adverse reactions (17.91%), Switching antibiotics enhances drug effects (17.66%), Broad-spectrum antibiotics are better than narrow-spectrum ones (25.12%) and Switching antibiotics reduces adverse reactions (14.93%). 64.18% of our respondents have never used another family member's antibiotics. 68.91 of our respondents agree that the unnecessary use of antibiotics makes them ineffective. 51% of our respondents have heard of resistance to antibiotics.

Respondents knew that resistance to antibiotics can be caused by Not completing the dosage (49.25%), Using antibiotics repeatedly (43.28%), and Self – medication (34.08%). Respondents knew that antibiotics is used for treating Bacteria infection (85.32%), viral infection (17.66%), and others (8.21%).

Discussion

Between March 2020 and February 2021, which was during the COVID – 19 First and second wave in Nigeria, 36.07% and 25.87% of outpatients of Gbagada General Hospital took antibiotics once and twice, respectively. Long delays in hospital (43.03%, Convenience (26.37%), Cost saving (20.90%), and attitude of hospital staff (18.16%) were mostly the reasons our respondents were self-medicating with

antibiotics. This is similar to the discovery of [31], those reasons reported for engaging in self-medication among undergraduate students and community members were due to long delays in the hospital, it being cheaper not to go to the hospital, and the distance to the hospital” [31]. Respondents self-medicated with antibiotics for Infection (40.55%), Fever (38.31%), Sore throat (27.36%), Cough (26.62%), Malaria (26.12%), Typhoid (19.40%), Diarrhea (16.92%), Aches and pains (16.67%). The majority of respondents (66.17%) do not have health insurance, while only 33.83% of respondents have health insurance. Level of awareness of antibiotic resistance amongst our respondents for were moderate (66.93%), Low (19.65% and High (16.42%). This justifies [31, 32] findings stating that” the most common reasons for self-administration of antibiotics were sore throat, fever, running nose and cough [31] [32]. Other reasons were dental infection, rheumatism, and fatigue, nasal congestion, fever, aches and pains, vomiting, diarrhea, and skin wounds.

Respondents that had tertiary education were 66.17%, Chi-Square showed that there was a significant association between level of education and use of antibiotics. Level of education had an effect in the level of knowledge and use of Self – medication with antibiotics. 25.12% of our respondents were unemployed, and the majority of respondents (66.17%) do not have health insurance righting to an increase in self-medication with antibiotics. As discovered by [31] that being unemployed and having no health insurance resulted to the self-administration of antibiotics. Most elderly outpatients at Gbagada General hospital do not self-medicate with antibiotics, unlike the young adult outpatients of Gbagada General hospital Gbagada. According to similar research conducted earlier, the most common self-medicating group were adults aged 40-49 while the least self-usage was in the 60-69 age groups, unlike a study carried out by [33] that discovered old patients, people above 60 years

old use a lot of old prescriptions for self-medication with antibiotics. People also get information from the internet without Doctor's prescription [34].

Doctor's and Pharmacist prescriptions for our respondents were 42.29% and 34.58%, respectively. For frequency of antibiotics use, the majority of our respondents fall in the category of others (62.44%), meaning that they only use antibiotics when needed and not weekly, monthly, bimonthly, or once in 3 months. The place of Purchase of antibiotics our respondents use for Self – medication were Local chemists (46.27%) and Patent Medicine stores (41.79%). 32.59% of our respondents said antibiotics can cure all infections. 48.26% of our respondents said antibiotics might be effective even if they don't complete their dosage. 36.57% and 3.23% of our respondents use left-over antibiotics from friends and family members without Doctor's prescription sometimes and always, respectively. The common adverse reaction of antibiotics experienced by respondents were Nausea (26.87%), Rash (24.13%), Vomiting (13.68%), Drug resistance (12.19%), Diarrhea (11.19%), and Vaginal thrush 93.235). 64.18% of our respondents have never used another family member's antibiotics. 68.91 of our respondents agree that the unnecessary use of antibiotics makes them ineffective. This is similar to a survey conducted by [31] those undergraduate students who showed that suggestions from family and friends (34.3%) were the most common explanation for self-medication of self-diagnosed illnesses. While in the community, prescription by physicians (33.5%) were the highest response for choice of antibiotics, followed by previous experience with the antibiotic (18%) and knowledge of the antibiotic (11%) [31]. The researchers discovered that undergraduate students were more likely than the community residents to subscribe to using left-over antibiotics from friends or family members without doctor's prescription; most times (12.5% and 8.5%,

respectively) and sometimes (57.4% and 40.3%) [31]. Similarly, the undergraduate students were more likely than the community residents to use antibiotics based on relative's advice; always (25.4% and 18.3%, respectively) and sometimes (61.4% and 37.7%) [31].

Knowledge of ABR varied among the respondents. Our respondents said that Intravenous is better than oral medication (27.36%), Higher doses result in faster recovery (15.67%), Lower doses result in less adverse reactions (17.91%), Switching antibiotics enhances drug effects (17.66%), Broad-spectrum antibiotics are better than narrow-spectrum ones (25.12%) and Switching antibiotics reduces adverse reactions (14.93%). Respondents knew that resistance to antibiotics can be caused by Not completing the dosage (49.25%), Using antibiotics repeatedly (43.28%), and Self – medication (34.08%). Respondents knew that antibiotics is used for treating Bacteria infection (85.32%), viral infection (17.66%), and others (8.21%). This justifies [31] findings that the undergraduate students, compared to the community residents displayed more knowledge of the fact that antibiotics cannot cure all infections (53% and 42.4%), that antibiotics are not used for cold (57.5% and 55.3%), and that unnecessary use of antibiotics could make them ineffective (68.4% and 62.9%) In contrast, community residents displayed better knowledge compared to undergraduate students when asked if antibiotics can be used for body pains (59.1% and 37.2%) and if antibiotics might be effective without completing the dosage (52.9% and 43.9%); the correct response was false. The undergraduate students, compared to the community residents, displayed less knowledge of the fact that self-medication could lead to the development of Antibiotics resistance (32.6% and 42.2%, respectively), but undergraduate students showed more knowledge that indiscriminate antibiotic use could cause Antibiotics resistance (51.3% and 41.8%) [31].

We are therefore accepting our hypothesis that lack of knowledge of awareness of antibiotics resistance $p = 0.024$ and high cost gives rise to Self – medication with antibiotics and there are other multiple factors or significant determinants like COVID–19 lockdown restrictions, long delays in hospital, the attitude of hospital staff and lack of health insurance determine causes of Self – medication with antibiotics.

Conclusion

The emergence and spread of drug-resistant pathogens have acquired new resistance mechanisms, which has led to antimicrobial resistance and has continued to threaten our ability to treat common infections. The most alarming is the rapid global trend of multi- and pan-resistant bacteria (also known as “superbugs”) that cause infections that are not treatable with existing antimicrobial medicines such as antibiotics [1].

In 2019 WHO discovered 32 antibiotics in clinical development that address the WHO list of priority pathogens, six were classified as innovative. A major concern was the lack of access to quality antimicrobials. Antibiotic shortages are currently affecting countries of all levels of development and especially in health-care systems [1].

Antibiotics are becoming increasingly ineffective as drug resistance increases globally, making it more difficult to treat infections and death. New antibacterial are really vital – for example, to treat carbapenem-resistant gram-negative bacterial infections as identified in the WHO priority pathogen list [1]. The outpatients of Gbagada General Hospital who are using these antibiotics generally do not have full information regarding their proper use. However, if the outpatients of Gbagada General Hospital do not stop self-medication with antibiotics now, these new antibiotics will suffer the same fate as the current ones and become ineffective.

Recommendation

- a) There is pressing importance for public health agencies, professionals, and the Federal Ministry of Health in Nigeria to enforce existing laws on antibiotics sales by Pharmacies, drug hawkers and enlighten the people on the dangers of ABR.
- b) We recommend the use of media (television, radio, newspaper, magazine, billboards, Facebook, Twitter, Instagram, Linkedin, Telegram, Tik Tok, Whatsapp etc.) to discourage the masses from self-medication with antibiotics.
- c) The Public should be encouraged to stop the misused and overuse of antimicrobials.
- d) The Public should ensure that they drink clean water and practice proper sanitation and adequate infection prevention and control to mitigate the spread of microbes.

Acknowledgement

All praises to God for the gift of life, mercy, and good health that enabled me to complete this research. My sincere gratitude to Lagos State Health Service Commission and Gbagada General Hospital for the permission, support, and opportunity given to me to carry out this study.

I would like to express my gratitude to Dr. Ann Ogbenna (a senior lecturer at College of the Medicine University of Lagos), who was instrumental to getting ethical approval for this research, data collector, Oluwatosin Adewumi, Mentor, Ms. Jesna, my lecturers, and its Management of Texila American University. I am highly thankful for the kind support bestowed on me by my Husband Mr. Noris Chimezie Odis, children (Chimuanya, Ogechukwu, Chisimudi), Sweet Mum, Mrs. Bibiana Anyichie, Siblings, family, friends, and all respondents in this study.

Conflicts of Interest

The author declares no conflict of interest.

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