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Awareness of Antibiotics Resistance in Public Health and Exploring Strategies to Combat it in A Hospital in The Niger Delta, Bayelsa State

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Abstract

Antibiotic resistance is a type of drug resistance where a microorganism can survive exposure to an antibiotic Although effective, medicines are often challenging to manage and use appropriately, hence inappropriate antibiotic use is a common occurrence, thereby increasing the risk of antibiotic resistance development. It is important to know the level of public awareness of antibiotic resistance. This study aims to assess the prescribing of antimicrobials in the management of bacterial infections and its utilization among hospitalized patients at Niger Delta University Teaching Hospital, Okolobri, Bayelsa State. 75 Questionnaires on "Evaluation of the level of awareness of antibiotic resistance on public health and exploring strategies to combat it in Niger Delta University Teaching Hospital will be distributed to the patients. Information on awareness of antibiotic resistance in public health and exploring strategies to combat it in Niger Delta University Teaching Hospital will be filled appropriately and retrieved after filling. This study has shown that there was a high rate of antibiotic consumption (81.33%) with ciprofloxacin being the most used antibiotic (20.92%), there was also a lack of understanding of the proper use of antibiotic drugs. Also, there was a high rate of antibiotic purchases from Pharmacy outlets (53.3%) and patent medicine vendors (24%) who do not give adequate information on the antibiotics purchased. A greater number of the respondents, about 63.33%, know that antibiotics are a prescription medicine. The importance of conducting clinical tests before antibiotic therapy is paramount as it narrows down the choice of antibiotic(s) needed to treat a particular infection, the majority (66.7%) of the respondents seems to agree that they perform MCS before antibiotics were prescribed.

A slightly greater number of the respondents fail to complete the antibiotic doses as majority stopped taking the antibiotics when they feel better or forget to take the medication properly. The data obtained from this study showed that a greater population of the respondents were not aware of what antibiotic resistance is or had not previously heard about it and they don't seem to understand some factors that cause antibiotic resistance. Surprisingly, high rates of antibiotic usage were found, about 81.33% of the respondents reported that they had used an antibiotic in the last six months before this study, Given the findings of this study, it was concluded that it is important that policymakers take appropriate measures to prevent antibiotic misuse, further strengthen the policy on prescription drugs and also create public educational programs to educate the populates on the use of antibiotics.

Keywords: Antibiotics; Prevent diseases; Patient Socio-Demographic Data; Harmful; Medical health care

Introduction

Modern medicine, or medicine as we know it, started to emerge after the Industrial Revolution in the 18th century. At this time, there was rapid growth in economic activity in Western Europe and the Americas. During the 19th century, economic and industrial growth continued to develop, and people made many scientific discoveries and inventions. Scientists have made rapid progress in identifying and preventing illnesses and in understanding how bacteria and viruses work. However, they still had a long way to go regarding the treatment and cures of infectious diseases.

So, when did the practice of medicine begin? And who were the first doctors? While there are no straightforward answers to these questions, there is evidence from primitive societies that 'treatments' were attempted for common conditions, although often superstition and religious beliefs would be intermingled with these. We do know that from ancient Egyptian times (from

around 3000 BC) there were 'doctors' and in this context, the medical practitioner Imhotep (around 2600 BC) produced a written work chronicling over 200 different medical conditions.

Medicines are one of the most common interventions used in health care to cure and prevent diseases and mitigate symptoms. Medicines are used by the very young to the very old, in inpatient and outpatient settings, and predominantly in the home setting where patients are responsible for their self-management (either alone or with the help of their careers and family members). In addition to prescribed medicines, there is a wide range of symptoms and conditions that can be managed by using non-prescription medicines (including herbal and complementary medicines) without consulting any healthcare professional or, if consulted, with the advice of a community pharmacist. (International Pharmacist Federation, 2020) b Although effective, medicines are often challenging to manage and use appropriately. This is due to several factors, such as increasingly complex pharmacotherapies, polypharmacy, aging populations with multiple diseases, and limited, or inadequately coordinated resources in healthcare systems [1,2]. In medieval times, medical practices virtually unrecognizable today was commonplace. For example, bleeding for those who were ill was seen as helpful in a wide range of conditions as was the administration of laxatives. Predominant at this time was the notion that the church had a duty to care for the sick with many hospitals being built

Aims of the Study

This study aims to assess the prescribing of antimicrobials in the management of bacterial infections and its utilization among hospitalized patients at Niger Delta University Teaching Hospital.

Objectives

i. To determine the pattern and types of antibacterial agents prescribed for patients at the hospital.

ii. To assess if the selection of antimicrobials for prescribing conforms to recommendations in Standard Guidelines like the National Treatment Guidelines and the British National Formulary.

iii. To assess patients' response to antibacterial treatment (using outcome measures like symptoms.

Method

Study Setting

The study was carried out within Niger Delta University Teaching Hospital located in Okolobri, Bayelsa State. Niger Delta University Teaching Hospital Has 29 departments, the study was carried out in 8 departments, A&E Pharmacy, BHIS Pharmacy, Ophthalmology Pharmacy, Pediatrics Pharmacy, O&G Pharmacy, store and active drug store, GOPD Pharmacy, and ARV Unit.

Research Population

The target population for this study was the patients of NDUTH residing in Obunna, age ranging from 16 years and above regardless of their gender, education, social class, religion, and ethnicity.

Research Design

This is a cross-sectional survey involving collection of data via questionnaires given to patients of NDUTH who are above 16 years of age, the questionnaire was designed based on the objective of this study. An initial pilot study was undertaken to ensure that the questions were appropriate and in the correct sequence. Only minor changes in the sequence of questions were deemed necessary.

Sampling Method

The sampling method used for this research is the convenience sampling method. Although the convenience sampling method is not the most recommended method of sampling [3] (Saunders et al, 2012), it was chosen due to time factor, ease of and cost research effectiveness.

Data Collection/Research Instrument

150 Questionnaires on "Evaluation of the level of awareness of antibiotic resistance on public health and exploring strategies to combat it in Niger Delta University Teaching Hospital will be distributed to the patients. Information on awareness of antibiotic resistance in public health and exploring strategies to combat it in Niger Delta University Teaching Hospital will be filled appropriately and retrieved after filling.

The questionnaire contained five sections: Section A contained the Social-demographic data such as gender, age, marital status, level of education, ethnicity, occupation, alcohol, and cigarette consumption; Section B contained questions on Knowledge of Antibiotics and Antibiotic Resistance; Section C contained questions relating to the Attitude Towards Antibiotic Use; Section D contained question of the Commonly Used Antibiotics; Section E contained questions on the Indiscriminate use of Antibiotics.

Data Analysis

The data were analyzed using Microsoft Excel and summarized using descriptive and inferential statistics in tabular form, pie charts, and bar charts. The descriptive analysis was done using frequency and percentage (%)

Ethical considerations

The consent of all the participants was sought verbally before the questionnaires were given to them. The information provided by willing participants was treated with utmost confidentiality.

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Data Analysis

This study included 75 respondents in total. All of the questionnaires were recovered, and examined, and the findings were tallied using Microsoft Excel, therefore none of the questions were deemed invalid.

Results

Analysis of Patient Socio-Demographic Data

Table 1 revealed that out of the 75 respondent that participated in the study 47(62.7%) were males while 28(37.3%) were females. Also 11(14.67%) respondents were within the age bracket 16-20years, 53(70.67%) were within the age bracket 21-30, 8(10.67%) respondents were within the age bracket 31-40years,1(1.33%) were within the age bracket 41-50 years, and 2(2.67%) were 51years and above. 64(85.33%) of the respondents were single, 8(10.67%) are married, 2(2.67%) are divorced and 1(1.33%) are widowed. 71(94.7%) are Christians, 3(4%) were Muslims and 1(1.3%) belong to other religious groups.

The majority of the respondent were Ijaw with 54(72%), 8(10.7%) were Igbos, 9(12%) were Yorubas and 4(5.3%) of the respondents were other ethnic People groups. 28(37.3%) of the respondents do not consume alcohol at all, 31(41.3%) rarely consume alcohol, 13(17.3%) often consume alcohol and 3(4.00%) regularly consume alcohol. 68(90.7%) do not smoke at all, 7(9.3%) smoke cigarette

Awareness of Antibiotic Resistance

Table 2 revealed that out of the 75 respondent that participated in the study. 47(62.7%) of the respondents agreed that they were not aware of antibiotic resistance, while 28(37.3) respondents were aware of antibiotic resistance. 46 respondents (61.3%) were uncertain that antibiotic resistance is increasing, 9 (12%) respondents disagreed that antibiotic resistance is increasing, and 20 (42.6%) respondents agreed that antibiotic resistance is increasing. 46(61.3%) agreed that we should be more concerned regarding antibiotics consumption, 29(61.7%) were uncertain about concern regarding antibiotics consumption, and no respondent disagreed about the concern regarding the consumption of antibiotics. 8(10.7%) respondents agreed they became aware of antibiotic resistance through a friend, while 9(12%) became aware through the hospital, 54(72%) through a pharmacy and 4(5.3%) through a patent medicine. 54(72%) respondents agreed that antibiotics resistance is harmful while 21(28%) were uncertain. 75(100%) respondents agreed that the public should be well informed about antibiotic resistance to reduce the cause of antibiotic resistance. 54(72%) respondents disagreed that physicians often prescribe antibiotics unnecessarily, 21(28%) respondents were uncertain about physician often prescribed antibiotics unnecessarily. 50 (66.7%) respondents were uncertain whether antibiotics in poultry and dairy industries should be monitored, and 20(26.7%) agreed that antibiotics should be monitored in poultry and dairy industries. All the respondents agreed that antibiotic resistance is very harmful.

Commonly used Antibiotics

Table 3 revealed that out of the 75 respondents who participated in the study, 61(81.33%) had taken antibiotics within the last six months, and 14(18.67%) had not. The most commonly used antibiotic was Amoxicillin which accounts for 20.9% of the total antibiotics taken, Ciprofloxicin accounts for 17.1%, Ampicillin accounts for 14.4%, Ampiclox accounts for 13.3%, Metronidazole (Flagyl) accounts for 11.8%, Tetracycline account for 11.2%, Cotrimoxazole (Septrin) account for 7.6%, Erythromycin account for 3.4%. 14.6% of the antibiotics were obtained from the Hospital, 52.8% were gotten from Pharmacy outlets, 24.4% were gotten from Patent medicine vendors (Chemists), 1.6 % were gotten from Hawkers and 6.6% were gotten from other sources. Table 3 revealed that out of the 75 respondents the reason for taking antibiotics, fever account for 22.2%, cough, and cold account for 21.1 %, 5. % account for any kind of pain, 2.8% account for surgery, 7.8% account for wound/fracture, 7.8% account for skin lesions/Pustules, 11.7% account for urinary tract infections, 8.3% account for ear infection, 10% account for gastroenteritis,3.3% account for other reason for taking antibiotics.

Knowledge of the Dangers of the Indiscriminate use of Antibiotics

Out of the 75 respondents, 65(86.7%) of the respondents agreed that antibiotics are prescription medicines, and 20(13.3%) disagreed that antibiotics are prescription medicine. 64(85.3) respondents agreed that you need to a doctor when feeling ill, while 11(14.7%) of the respondents disagreed with seeing a doctor when you are feeling ill. 50(66.7%) respondents gave a sample for microscopy culture and sensitivity to the lab 25(33.3%) of the respondents did not give any sample for microscopy culture and sensitivity to the lab. 50(66.7%) agreed that they collected results for the MCS before the prescription was made, and 25(33.3%) did not obtain results for the MCS before the prescription were made. 44(58.7%) of the respondents reported that they did not complete the antibiotic therapy and 31(20.7%) did complete their antibiotic therapy.

The respondents stopped taking the antibiotics when they felt better accounting for 49.2% of the reasons they did not complete the doses of the antibiotics, some respondents usually do not complete the course of the antibiotics which accounts for 4.1% of the reasons they did not complete the doses, allergic reaction accounts for 4.1%, forgetting to take the medicine account for 15.7% and stomach discomfort account for 2.5% why the respondents they do not complete the dose of the antibiotics. 47(62.6%) of the respondents were aware of the adverse events that could arise from using antibiotics and 28(37.3%) were not

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aware. 60(80%) of the respondents reported that it was not okay to buy antibiotics without prescription when they were feeling well and 25(33.3%) indicated that it was not ok. 45(60%) of the respondents agreed that they experienced possible side effects when taking antibiotics, 30(40%) of the respondents did not experience any side effect when taking antibiotics. 50 (66.7%) of the respondents did not seek advice from any medical health professional during taking antibiotics, 25(33.3%) of the respondents seek medical advice from medical health care practitioners during the course of antibiotics therapy. 20 of the respondents agreed the advice was useful. See details in Tables 1-4 & Figure 1-3 below.

Table 1: Showing the Socio-Demographic Data.

Respondent	Frequency	Percentage %
Characteristics		
Male	47	62.7
Female	28	37.3
Total	75	100
Age		
16-20	11	14.67
21-30	53	70.67
31-40	8	10.67
41-50	1	1.33
51 and above	2	2.67
Total	75	100
Marital Status		
Single	64	85.3
Married	8	10.67
Divorced	2	2.67
Widowed	1	1.33
Total	75	100
Religion		
Christian	71	94.7
Muslim	3	4
Other religion	1	1.3
Total	75	100
Ethnicity		
Ijaw	54	72
Igbo	8	10.7
Hausa	9	12
Other	4	5.3
Total	75	100
Alcohol consumption		
Not at all	28	37.3
Rarely	31	41.3
Often	13	17.3
Regulary	3	4
Total	75	100
Smoking		
Do not smoke	68	90.7
Smoke	7	9.3
Total	75	100

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Table 2: Shows awareness of antibiotic resistance.

Responses	Frequency	Percentage
Are you aware of antibiotic resistance		
Yes	28	37.3
No	47	62.7
Total	75	100
Do you think antibiotic resistance is increasing		
True	20	26.7
False	9	12
Uncertain	46	61.3
Total	75	100
Do you think we should be more concerned regarding antibiotic consumption?		
True	20	42.6
False	9	12
Uncertain	46	61.3
Total	75	
How did you become aware		
Friend	8	10.7
Hospital	9	12
Pharmacy	54	72
Patent medicine	4	5.3
Total	75	100
Do you know or think resistance to antibiotics is harmful		
Yes	54	72
No	21	28
Total	75	100
Do you think that more public awareness information be given to reduce antibiotic resistance		
Yes	75	100
No	0	0
Uncertain	0	0
Total	0	100
Do you think physicians often prescribe antibiotics unnecessarily?		
True	0	
False	54	72
Uncertain	21	28
Total	75	100
Do you think antibiotics in poultry and dairy industries should be monitored		
TRUE	20	26.7
False	5	6.7
Uncertain	50	66.7
Total	75	100
How harmful do you think antibiotic resistance is?		
Very much	75	100
Much	0	0
Not much	0	0
Total	75	100

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Table 3: Shows commonly used antibiotics.

Responses	Frequency	Percentage
Have you taken any antibiotics within the last six months?		
Yes	61	81.33
No	14	18.67
Total	75	100
Which of these antibiotics have you taken before?		
Ampicillin	38	14.4
Amoxicillin	55	20.9
Ampiclox	35	13.3
Metronidazole(flagyl)	31	11.8
Cotrimoxazole	20	7.6
Erythromycin	9	3.4
Tetracycline	29	11.02
Ciprofloxacin	45	17.1
Other	1	0.38
Where did you purchase the antibiotics?		
Hospital	18	14.6
Pharmacy	65	52.8
Patent medicine	30	24.4
Hawkers	2	1.6
Others	8	6.5
Which of these conditions did you take antibiotics for?		
Fever	40	22.2
Cough/cold	38	21.1
Any kind of pain	9	5
Surgery	5	2.8
Wound/fracture	14	7.8
Boil/skin lesion	14	7.8
UTI	21	11.7
Ear infection	15	8.3
Gastroenteritis	18	10
Others	6	3.3
Was it prescribed to you by a?		
Medical doctor	20	15.03
Pharmacist	65	48.9
Friend	8	6.02
Nurse	32	24.1
Self-medication	8	6.02

Table 4: Showing knowledge of the danger of the indiscriminate use of antibiotics.

Responses	Frequency	Percentage
Do you know antibiotics are prescription medicine?		
Yes	65	86.7
No	10	13.3

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Total	75	100
Do you think you need to see a doctor when you are feeling I'll?		
Yes	64	85.3
No	11	14.7
Total	75	100
Did you give any samples for microscopy culture and sensitivity(MCs) to the lab?		
Yes	50	66.7
No	25	33.3
Total	75	100
Did you obtain the result for the MCS before prescription was made		
Yes	50	66.7
No	25	33.3
Total	75	100
Did you complete the course of antibiotic?		
Yes	44	58.7
No	31	41.3
Total	75	100
Do you fail to complete the doses of antibiotics? If No why did you not complete the dose of antibiotic?		
Stopped taking antibiotics when I feel better	30	50.8
Usually do not complete the course of antibiotics	5	8.5
Stopped taking antibiotics when I faced allergic reactions	5	8.5
Forget to take medicine properly	16	27.1
Stopped taking antibiotics when stomach discomfort occurs	3	5.1
Other reason	0	0
Total	75	100

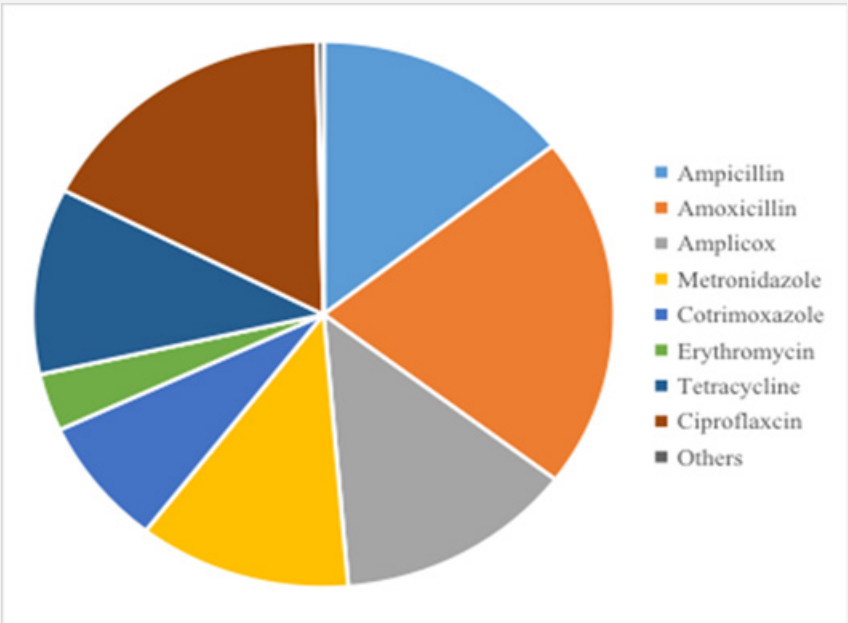

Figure 1: Respondent's reply on which antibiotics were taken previously.

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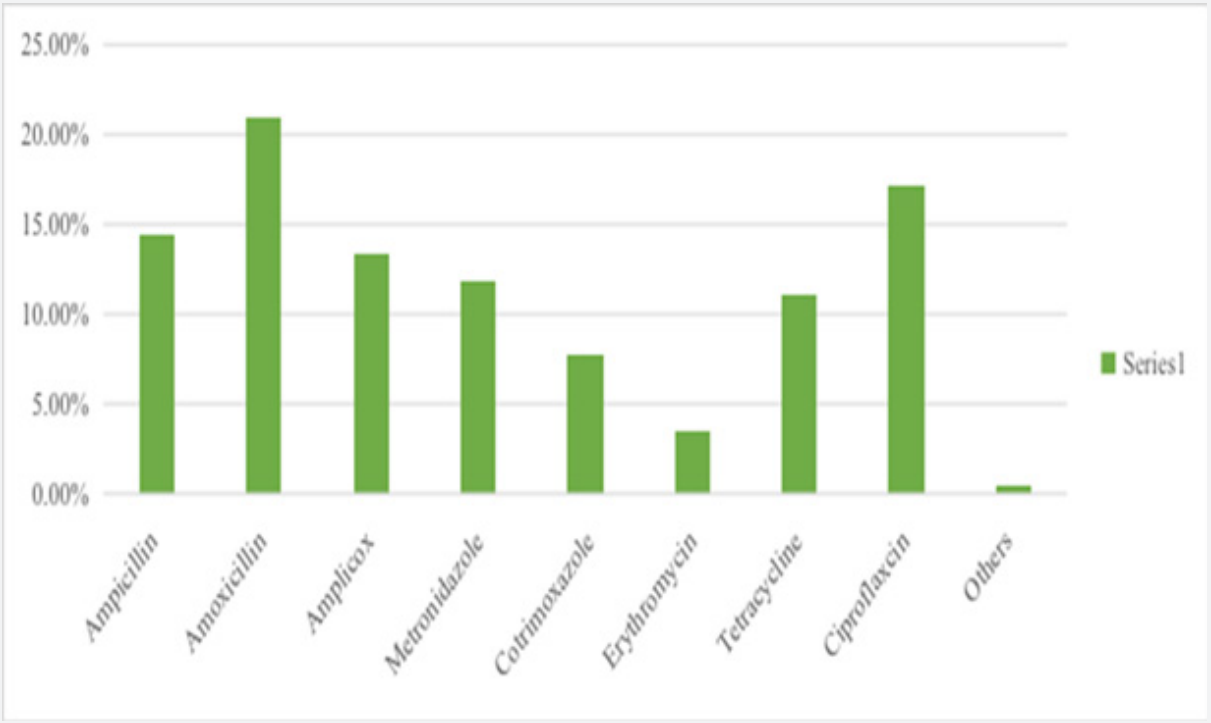

Figure 2: Respondent's reply on which antibiotics were taken.

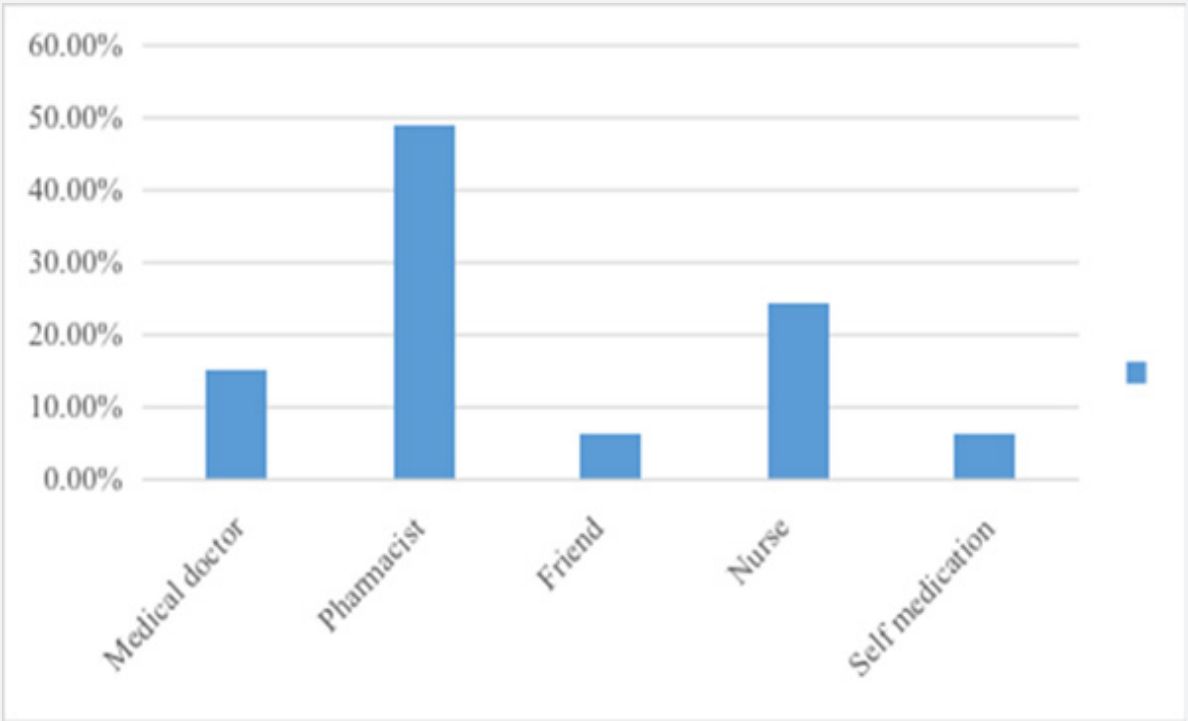

Figure 3: Respondent reply on where antibiotics were purchased from where Antibiotics were purchased from.

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Discussion

The data obtained from this study showed that a greater population of the respondents were not aware of what antibiotic resistance is or had not previously heard about it and they don't seem to understand some factors that cause antibiotic resistance. Surprisingly, high rates of antibiotic usage were found about 81.33% of the respondents reported that they had used an antibiotic in the last six months before this study, with the penicillin class of antibiotics (Amoxicillin, Ampicillin, and Ampiclox) and Ciprofloxacin being the most commonly used antibiotics. Majority of the antibiotics used were purchased from Pharmacy outlets and Patent medicine vendors. Fever, Cough cold, and Urinary tract infections account for majority of the antibiotic usage. A greater number of the respondents, about 63.33% know that antibiotics are a prescription medicine. The importance of conducting clinical tests before antibiotic therapy is paramount as it narrows down the choice of antibiotic(s) needed to treat a particular infection, the majority (66.7%) of the respondents seem to agree that they performed MCS before antibiotics were prescribed, A slightly greater population of the respondent does fail to complete the antibiotic doses as majority stopped taking the antibiotics when they feel better or forget to take the medication properly. The Consumption of antibiotics without proper prescription and directives may result in therapeutic failure when an under dose is administered, which can prolong the treatment period and cause antibiotic resistance, while an overdose may destroy normal microbial flora leading to secondary infection.

Without proper prescription and directives may result in therapeutic failure when and under dose is administered, which can prolong the treatment period and cause antibiotic resistance, while an overdose may destroy normal microbial flora leading to secondary infection.

The antibiotics used in livestock are ingested by humans when they consume food. The transfer of resistant bacteria to humans by farm animals was first noted more than 35 years ago when high rates of antibiotic resistance were found in the intestinal flora of both farm animals and farmers. More recently, molecular detection methods have demonstrated that resistant bacteria in farm animals reach consumers through meat products. This occurs through the following sequence of events.

i. Antibiotic use in food-producing animals kills or suppresses susceptible bacteria, allowing antibiotic-resistant bacteria to thrive.

ii. Resistant bacteria are transmitted to humans through the food supply.

iii. These bacteria can cause infections in humans that may lead to adverse health consequences.

54% of the respondents disagree that antibiotics in poultry and dairy industries should be monitored, and 21% were uncertain leading to resistance through agriculture means that why the public needs to be more aware of Antibiotic resistance and more knowledge should be provided [4-78].

Conclusion

This study highlights several important concerns related to antibiotic use amongst the patient of Niger Delta University, Teaching Hospital Okolobri, Bayelsa State which requires attention. There was a high rate of antibiotic consumption, there was also a lack of understanding of the proper use of antibiotics evident from their use in treating Colds and coughs, fever, and viral infections. There was also a lack of awareness concerning the danger of antibiotic use and also a high rate of antibiotic purchase from patent medicine vendors.

Recommendation

Policymakers must take appropriate measures, to prevent antibiotic misuse and further strengthen the policy on prescription drugs. Target orientation and education on the use of antibiotics amongst the student community and Pharmacists should only dispense antibiotics who present a prescription or better still after proper diagnosis confirmed by Laboratory test(s).

Contribution to literature

This study's findings have contributed to an existing body of knowledge that cough and other minor reasons are implicated in antibiotic use in this part of the world.

Acknowledgment

The researchers appreciate the statistician, respondents, and co-researchers for the time.

Conflict of Interest

The researchers declare that there was no conflict of interest.

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