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RESEARCH ARTICLE

Knowledge, Attitude and Pattern of Antibiotic Usage among Students of a Nigerian University

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ABSTRACT

Objective: Antibiotic resistance is a major public health issue globally fueled largely by its misuse. Controlling this problem would require an understanding of the levels of awareness of the population towards antibiotics.

This study assessed the baseline information on the knowledge, attitude and practice towards antibiotics among university students in Ogun State Nigeria.

Methodology: A cross-sectional study was conducted between January and March 2016 among a convenience sample of undergraduate students attending Covenant University, Ogun State, Nigeria. Self-administered questionnaires were employed to obtain information on knowledge, attitude and practice towards antibiotic usage.

Results: A total of 357 students were recruited into this study. 60.6% of the participants had taken antibiotics in the 6 months preceding the study of which two-thirds stated that they seldom complete the antibiotic dosage. Doctors (53.1%) and parents (22.9%) were responsible for most antibiotic prescriptions in this study. Knowledge assessment showed fair knowledge of antibiotic use and drug resistance.

Conclusions: This study shows that the study population has average knowledge of antibiotics use hence the need to generate more awareness. *J Microbiol Infect Dis 2019; 9(1): 10-15.*

Keywords: *Antibiotic usage, antibiotic resistance, drug resistance*

INTRODUCTION

Antibiotics are instrumental in reducing the burden of infectious diseases and have become essential for many medical interventions. The emergence of drug resistant pathogens however, is a major threat to public health especially in developing nations. The emergence of drug resistant strains has led to the adoption of more expensive drug variants [1] not easily accessible by persons in low and middle-income nations hence an increase in morbidity and mortality resulting from resistant strains. A major driver of antibiotic resistance is the selection pressure that results from the inappropriate consumption of antibiotics. This is partly influenced by the availability of cheap antibiotics over the counter and the inappropriate prescription of antibiotics by health care personnel [2,3]. Controlling this problem would require regulatory measures alongside awareness campaigns to ensure that antibiotics are used appropriately. Effective control measures are however predicated on an understanding of the perceptions and attitudes of the populace towards antibiotics. Many studies around the world have reported the attitudes of persons towards antibiotics citing age, gender and level of education as major predictors of inappropriate antibiotic use [4–8]. A recent study reported poor knowledge in as high as 62% of non-medical students in a major Nigerian University [9], similar studies performed in Jordan [10], India [4] and Sri-Lanka [11] also reported subpar levels of knowledge amongst students. Such investigations among tertiary level students are important as this population constitutes a segment of the society that is highly educated and more inclined to information about health. The objective of this study was to investigate the level of knowledge, attitudes, and behaviors regarding antibiotics use among the students of a University in Nigeria.

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METHODS

A cross-sectional study was conducted from January to March 2016 among undergraduate students attending Covenant University, Ogun State. Covenant University has an undergraduate student population of 6000 and is made of four colleges namely, College of Science and Technology (CST), College of Engineering (CoE), College of Business Studies (CBS) and College of Development Studies. Random convenient samples of 357 students were included in this study based on their willingness to complete the self-administered questionnaire.

Students were split into Science and non-science categories based on the college to which they belong. Students from CST and CoE were categorized as 'Science' students while students from CBS and CDS were categorized as 'Non-science'.

A 35-item questionnaire was developed from existing studies [5,9,10,12,13]. The self-administered questionnaire had three sections; the first section sought to obtain demographic information of participants, the second section assessed patterns of antibiotic usage of students while the third section assessed their perceptions and knowledge of antibiotics.

A subset of 10 questions were used to assess how knowledgeable the respondents were about the subject matter. One point was assigned to correct responses and zero to incorrect responses. Respondents scoring 6 points and above were considered to have good knowledge while respondents scoring below 6 points were considered to have poor knowledge [4,9,14].

All statistical analysis was performed using SPSS software Version 20.0 (SPSS Inc., Chicago, IL, USA). Chi-square test was used to assess relationships between dependent and independent variables to establish statistical significance. A P value of <0.05 was considered as statistically significant.

RESULTS

A total of 357 students were included in this study of which 152 (42.6%) were male and 203 (59.6%) were female. Most respondents were within the age group of 19-21 (51.5%). Sixty-six percent of the students included in this study have a background in science while 34% were from non-science backgrounds (Table 1).

More than half (60.6%) of the students had used an antibiotic in the past six months of conducting this study with two thirds (75.2%) following the dosage instructions strictly and males having a higher tendency than females to have taken antibiotics (Table 2). Doctors (53.1%) and Parents/Guardians (22.9%) prescribed of antibiotics the most while ampicillin (20.7%) and Penicillin (17.1%) were the highest prescribed antibiotics (Figs 1 & 2). In almost half (47.4%) of the cases where a Doctor prescribed an antibiotic, there was no laboratory test performed. Almost all students (97.9%) had used an antibiotic without a doctor's prescription with 64.7% stating that perform self-medication often (Table 3). Pharmacies (39.7%) and drugs available at home (30.4%) were the highest sources of antibiotics (Fig 3).

The knowledge assessment showed fair knowledge of antibiotics use and resistance with only 51.7% of students passing our set threshold for knowledge about antibiotics. Students in the sciences (54.5%) had a better knowledge than their non-science (46.3%) counterparts with students in CST (56.0%) having the highest knowledge scores. Across the different levels of education, first year students had significantly higher knowledge than other levels. Also, knowledge increased with increasing age while more females (53.7%) than males (49.3%) had good knowledge of antibiotics (Table 4).

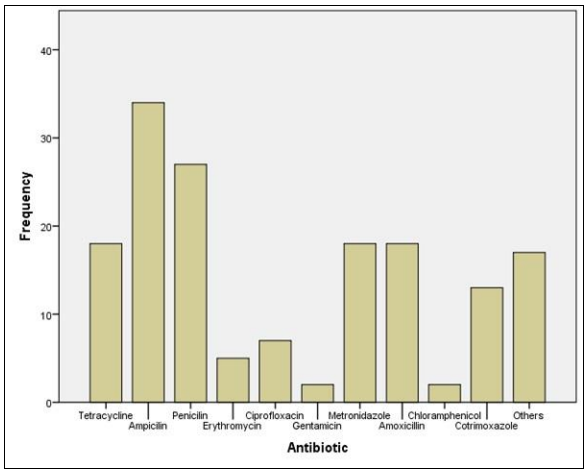

Figure 1. Frequency of drug prescriptions.

Table 1. Summary of study participants.

Sex	Male	152 (42.6%)
	Female	203 (56.9%)
	No Response	2 (0.6%)
Age Group	14-18	138 (38.7%)
	19-21	184 (51.5%)
	22-24	32 (9.0%)
	No Response	3 (0.8%)
Discipline	Science	235 (66%)
	Non-Science	121 (34%)
College	CST	184 (51.5%)
	CoE	51 (14.3%)
	CBS	82 (23.0%)
	CDS	39 (10.9%)
	No Response	1 (0.3%)
Level	100	61 (17.1%)
	200	111 (31.1%)
	300	32 (9%)
	400	114 (31.9%)
	500	35 (9.8%)
	No Response	4 (1.1%)

Table 2. Patterns of antibiotic usage.

	Yes			No		
Questions	Male	Female	Total	Male	Female	Total
Have you taken Antibiotics in the past six (6) months?	95 (62.9)	119 (58.9)	214 (60.6)	56 (37.1)	83 (41.1)	139 (39.4)
Do You Adhere Strictly to the dosage instructions	75 (75.8)	101 (74.8)	176 (75.2)	24 (24.2)	34 (25.2)	58 (24.8)
Do you think it's important to complete the drug dosage, even if all symptoms are gone	94 (71.2)	131 (74.9)	225 (73.3)	38 (28.8)	44 (25.1)	82 (26.7)
Do you always complete your dose as prescribed by the physician	52 (36.9)	85 (45.9)	137 (42.0)	89 (63.1)	100 (54.1)	189 (58.0)
Do you keep leftover drugs for future use?	78 (53.8)	111 (59.7)	189 (57.1)	67 (46.2)	75 (40.3)	142 (42.9)
Are you aware that improper use of antibiotics could be harmful?	106 (74.6)	146 (75.3)	252 (75.0)	36 (25.4)	48 (24.7)	84 (25.0)
Do you take Antibiotics for Cold?	45 (34.9)	62 (36.3)	107 (35.7)	84 (65.1)	109 (63.7)	193 (64.3)
If yes, do you get better after taking antibiotics	57 (41.9)	79 (58.1)	136 (85.5)	15 (65.2)	8 (34.8)	23 (14.5)

Table 3. Patterns of antibiotic usage.

Question	Always/Often			Rarely/Sometimes			Never		
	Male	Female	Total	Male	Female	Total	Male	Female	Total
Have you ever used antibiotics without a doctor's prescription?	95 (66.6)	123 (63.1)	218 (64.7)	46 (32.4)	66 (33.8)	112 (33.2)	1 (0.7)	6 (3.1)	7 (2.1)
If the doctors refused to prescribe antibiotics for you, would you insist on the doctor doing so?	29 (19.7)	34 (17.6)	63 (18.5)	105 (71.4)	145 (75.1)	250 (73.5)	13 (8.8)	14 (7.3)	27 (7.9)

Table 4. Antibiotic knowledge assessment.

Variables		Poor Knowledge	Good Knowledge	P value
Discipline	Science	107 (45.5)	128 (54.5)	0.143
	Non-Science	65 (53.7)	56 (46.3)	
College	CST	81 (44.0)	103 (56.0)	0.314
	CoE	26 (51.0)	25 (49.0)	
	CBS	42 (51.2)	40 (48.8)	
	CDS	23 (59.0)	16 (41.0)	
Level	100	22 (36.1)	39 (63.9)	0.004
	200	69 (62.2)	42 (37.8)	
	300	14 (43.8)	18 (56.2)	
	400	46 (40.4)	68 (59.6)	
	500	18 (51.4)	17 (48.6)	
Age Group	14-18	69 (50.0)	69 (50.0)	0.439
	19-21	89 (48.4)	95 (51.6)	
	22-24	12 (37.5)	20 (62.5)	
Sex	Male	77 (50.7)	75 (49.3)	0.417
	Female	94 (46.3)	109 (53.7)	

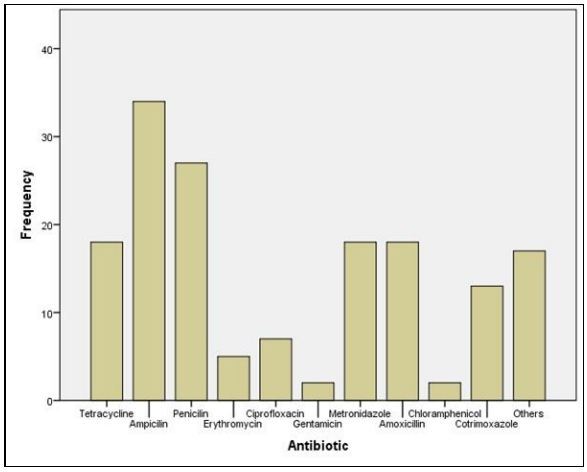

Figure 2. Types of antibiotics used.

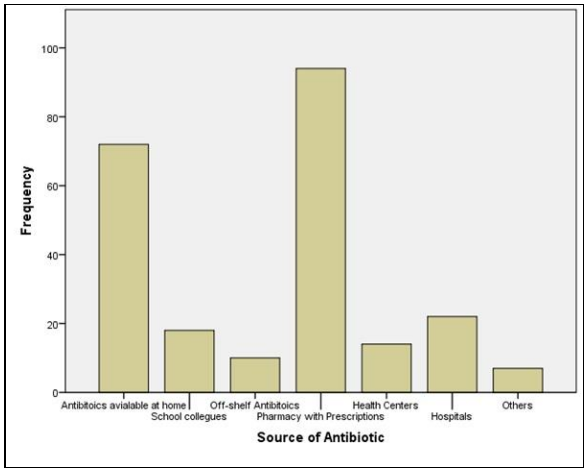

Figure 3. Sources of antibiotics.

DISCUSSION

Antibiotic resistance remains a significant public health problem worldwide. There is a paucity of information on the knowledge of antibiotic use among Nigerian university students. This study assessed the knowledge, attitude and practice of antibiotic usage and resistance among students in a Nigerian University.

Results from this study showed average knowledge (Mean Score: 5.51 ± 2.69, Range 0-10) of antibiotic usage with more than half of students surpassing the knowledge threshold in the assessment. Only 35.7% of students stated that they take antibiotics for cold, adding more credence to the good level of antibiotic awareness of the students. Level of study was a major predictor for good knowledge (P=0.004) supporting the findings of an earlier study [9]. Findings from this study however don't mirror a similar study where age was found to be a predictor of knowledge [9], this may be due to the small age range (14-24) of participants in this study. More than half of the students agreed that antibiotic misuse was a major driver of antibiotic resistance and that antibiotic resistance is a problem in Nigeria, however almost all (98.5%) of the students had used an antibiotic in the past without prescription. This is indicative of an unwillingness to adhere to what they know to be the right thing to do. This study

also shows some evidence of patient pressure on doctors to prescribe antibiotics even when it is unrequired; we suspect this may be a driver of illicit antibiotic.

The highest knowledge scores (6.48 ± 2.31 CI 5.88-7.07) were however found amongst first year students, this is in disagreement with several studies that found higher level students to have more knowledge [4,9]. About 60.6% of the participants had taken antibiotics in the 6 months preceding the study of which two-thirds stated that they seldom complete the antibiotic dosage. The proportion of students who obtained their antibiotics from either a doctor or pharmacist is similar (64.2%) to previous studies [10,15]. Parents however were responsible for almost a quarter of all prescriptions. Ampicillin (20.7%) and Penicillin (17.1%) were the most used antibiotics. Major sources of antibiotics were the pharmacy (39.7%) and left-over antibiotics available at home (30.4%). The high use rates of Ampicillin and Penicillin in this study signals an over dependence on these antibiotics and poses a major threat to public health in Nigeria has there have been reports of high levels of resistance to said drugs [16,17]. Furthermore, the fact that most students (67.4%) answered that antibiotics could treat viral infections is a cause for concern and indicative of antibiotic overuse. This poses a major threat to public health as the aforementioned antibiotics form the main stay of treatment in many resource poor regions.

Conclusion

It is evident from this study that while students have good knowledge of antibiotics and antibiotic resistance, their attitudes to antibiotics is not in tandem with their knowledge. It is therefore imperative to reorient students via sensitisation campaigns in a bid to reducing the occurrence of antibiotic misuse and subsequently antibiotic resistance.

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Declaration of Conflicting Interests: The authors declare no conflicts of interest

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Ethical Statement: This study was reviewed and approved by the Biological Sciences Ethical Review Committee, Covenant University with approval number: CU/BIOSCRECU/BIO/2016/034

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