

Original Research Article

KNOWLEDGE, ATTITUDE AND PRACTICE TOWARDS ANTIBIOTICS USE AMONG NON-MEDICAL UNIVERSITY STUDENTS IN UYO, NIGERIA

Abstract

Background: The widespread use, misuse and overuse of antibiotics in human and veterinary medicine have resulted in emergence and spread of antibiotics resistance consequently decreasing their effectiveness and efficacy. Recent studies consistently reveal that university students have limited knowledge and widely misuse antibiotics thereby increasing the spread and problem of resistance. This study aims to obtain baseline information on the knowledge, attitude and practice towards antibiotics use and resistance among university students in Uyo, Nigeria.

Method: A cross-sectional questionnaire based study of the knowledge of, attitude and perception to antibiotics use and resistance was conducted among convenience sample of non-medical students attending one of the major universities in Uyo, South-South of Nigeria for a period of three months between April and June 2017. Descriptive and multivariate logistic regression was used in data analysis. **Results:** Out of the 335 questionnaire distributed, 15 were excluded for incomplete demographics and less than 80% filling (response rate, 95.5%). The knowledge assessment test shows poor knowledge of antibiotics use and resistance among two hundred and one non-medical students (62.8%) while one hundred and nineteen students (37.2%) had good knowledge. Year of study and age were significantly associated with knowledge of antibiotics use and resistance while there was no statistical relationship between gender and knowledge scores. More than half of the participants (51.9%) have taken antibiotics within the last six months while only 43.1% completed the last antibiotics prescribed to them. One hundred and eighty nine students have self-medicated in the past and more than one third of them were to treat cold and cough symptoms.

Conclusion: This study substantiates that limited knowledge of antibiotic use and resistance exists among non-medical university students in Uyo, Nigeria. It also suggests a high level of antibiotics misuse in the form of non-adherence to prescribed dose of antibiotics and self-medication majorly for treating respiratory symptoms. Based on these findings, we recommend a sustained continuing medical education for healthcare workers and public health awareness campaigns. In addition, antibiotic sales should be strictly regulated in Nigeria to prevent their indiscriminate use of medicine.

Key words: Antibiotics, resistance, public health, non-medical university students, self-medication.

37 Introduction

38 Since the discovery of Antibiotics in the 1920s, it has been used successfully to treat deadly bacterial
39 infections for example, pneumonia and for preventing infections such as in surgical prophylaxis. They
40 are also increasingly used in animal husbandry for treating infections, for prophylaxis and for growth
41 promotion. Presently, antibiotics are one of the most commonly prescribed medicine in most
42 developing countries including Nigeria [1-3] In Nigeria, veterinary antimicrobial consumption is
43 expected to increase to 163% between 2010 and 2030 [4].

44 The widespread use, misuse and overuse of antibiotics in human and veterinary medicine have
45 resulted in emergence and spread of antibiotics resistance consequently decreasing its effectiveness
46 and efficacy. The emergence of antibiotics resistance is a major global health threat causing difficult
47 to treat infections, therapeutic failure, increased patient mortality and higher treatment cost and it has
48 been predicted that Nigeria is one of the countries at great risk of suffering these impacts [5]. Overuse
49 and misuse of antibiotics is often enhanced by access to antibiotics without a physician's prescription,
50 economic factor, lack of knowledge and the unregulated sales and consumption of antibiotics as over
51 the counter medicine in most low and medium income countries. This situation appears to be worse
52 in Nigeria where regulation concerning drug sales, distribution and supply are weak and almost non-
53 existent [6]. Drug distribution in Nigeria is chaotic and consists of several outlets of pharmacy shops,
54 drug chemist, street hawkers and open drug markets where people easily walk in and demand for an
55 antibiotic without a physician's prescription [6]. The widespread indiscriminate sales and use of
56 antibiotic in Nigeria is often spurred by ignorance, greed, high cost of drugs, corruption and weak
57 enforcement of regulatory laws. Examples of misuse of antibiotics include the use of antibiotics to
58 treat non-bacterial infections such as cold, flu and non-adherence to treatment regimens.

59 Recent studies consistently reveal limited knowledge of antibiotics and irrational use of antibiotics
60 among university students thus increasing the spread of antibiotics. In 2015, a study was conducted to
61 determine knowledge of antibiotic use and self medication practices among non-medical university
62 students in Jordan [7]. More than half of the students could not accurately identify the uses of
63 antibiotics and have self-medicated in the past. Similarly, a study of antibiotics use among non-
64 medical Nigerian university students revealed gross misuse of antibiotics among the students where
65 about 72.3% did not adhere to treatment regimen [8].

66 Appropriate use of antibiotics in the society is enhanced by correct knowledge, positive beliefs and
67 attitude. Public health awareness and education on antibiotic use is crucial for the control of the
68 spread of antibiotics resistance because it builds understanding and changes social attitude. The World
69 health organization global action plan identified five strategies for control of antibiotics resistance out
70 of which includes increasing public awareness and understanding through effective public

communication and optimization of antibiotics use in humans [9]. It is important to have a primary understanding of the knowledge, attitude and perception (KAP) towards antibiotics use among different groups within a population such as university students in order to determine risk factors and target interventions to suit specific needs. Furthermore, the need for this study is driven by the lack of KAP studies on antibiotic use in Uyo, Nigeria. Thus, this study aims to obtain baseline information on the knowledge, attitude and practice towards antibiotics use and resistance among university students in Uyo metropolis.

Method

A cross-sectional questionnaire based study of the knowledge of, attitude and practices to antibiotics use and resistance was conducted among convenience sample of non-medical students attending one of the major universities in Uyo, South-South of Nigeria. The study was conducted for a period of three months between April and June 2017. Participation was anonymous and voluntary where completion and submission of the questionnaire was taken as consent to participate in the study. High level of confidentiality was maintained throughout the study. Students were selected for the study if they were not admitted into medical programs such as medicine, dentistry, pharmacy and nursing. Before administering the questionnaire, the objective of the questionnaire was explained and students were further encouraged to voluntarily participate in the study. The pre-tested questionnaire was administered to students during regular class sessions and submission was on the same day of administration.

Research instruments were self administered questionnaires designed to get an overview of students' knowledge of antibiotic use and resistance and obtain information on the attitude and practices of non-medical university students regarding antibiotics usage. The questionnaire was developed after comprehensive literature review of related studies [7, 8, 10, 11] and then modified to suit the local context. The questionnaire was then pre-tested on 20 students and adjusted as appropriate so that the questions were easy and simple to understand and answer while providing accurate information. The 22 points questionnaire comprises three sections. The first part explored socio-demographic data such as age, gender and level of study. The second part consisted of eight questions which evaluated the students' knowledge of key areas of antibiotics, identification, prudent use, indication and possible causes of resistance and based on 3 scale responses, yes, no and not sure. Lastly, the third part consisted of questions related to attitudes and practices towards antibiotics use such as source, adherence, self-medication and reason and consisted of both open and close-ended questions.

A questionnaire was considered valid if all demographics were filled and 80% of the questions completely answered. Data were entered and analysed using SPSS version 20 for windows to generate descriptive statistics. Descriptive statistics such as frequency, percentage were employed to analyze

data. Chi square was also used to assess relationship between dependent and independent variables to establish statistical significance. A P value of <0.05 was considered as statistically significant. The Knowledge assessment was scored by assigning one mark to correct answer and zero to incorrect response. A score of <6 was considered poor knowledge while a score of ≥ 6 was taken as good knowledge. The scale measured knowledge at a score range of 0 to 8.

RESULTS

A total of 335 students participated in the study out of which 15 questionnaires were excluded due to incomplete and missing information giving a response rate of 95.5%. Out of the 320 included participants, 134 were males while 186 were females. Most respondents were within the age bracket of 15-25 years (82.5%). Table 1 describes the demographic characteristics of participants.

Table 1: Respondents demographic characteristics and their knowledge of antibiotics use

Demographics characteristics	Total (N=320)%	Poor knowledge (n = 201) %	Good knowledge (n=119) %	Chi Square	P value
Gender					
Male	134 (41.9)	96 (71.6)	38(28.4)	7.694	0.06
Female	186(58.1)	105 (56.4)	81 (43.5)		
Age					
15-24	237 (74%)	154 (65)	83 (35)	266.11	<0.0001
25-30	62(19.4%)	36 (58.1)	26 (41.9)		
31-40	21(6.7%)	11(52.3)	10 (47.6)		
Year of study					
1 st year	61(19.1%)	41(67.2)	20(32.8)	512.27	<0.0001
2 nd year	105 (32.8)	66 (62.9)	39(37.1)		
3 rd year	51 (15.9)	32(62.7)	19(37.3)		
4 th year	103 (32.2)	62(60.2)	41(39.8)		

Percentage poor/good knowledge (%) = number of poor/good knowledge among selected category/ number of participants among the same category * 100. For instance; % poor knowledge among males = $96/134 * 100$

The knowledge assessment test shows poor knowledge of antibiotics use and resistance among two hundred and one non-medical students (62.8%). Female students showed slightly higher knowledge than the male students although the difference was not statistically significant (Table 2). 71.6% of female respondents had poor knowledge of antibiotics compared 56.4% of the participating males. On the other hand, there is a high significant correlation between increasing age group and good knowledge of antibiotics ($p < 0.0001$). Participants in the age group of 31-40 had good knowledge of antibiotic usage (47.6%) than other age groups; 25-30(41.9%) and 15-24(35%). Similar association

was observed among different levels of study where fourth year students had better knowledge of antibiotics use and resistance compared to other level of study.

Nearly all respondents (91.3%; 95% CI 88.2-94.4) claimed they know what antibiotics are. Table 3 presents the proportion of students who gave correct answers to questions on knowledge about antibiotics usage. While 86.3% of the participants answered correctly that antibiotics can kill bacteria, only 25% disagreed to the statement that ‘antibiotics can kill viruses.’ Less than one half of the participants correctly answered that antibiotics can kill useful bacteria that normally live on the skin and in the stomach (47.2%, 95%CI 41.7-52.7). Similarly, 47.1% were able to correctly answer that antibiotics treatment should always be completed. Confusion on the emergence of antibiotics resistance exists in this study. 59.4% of the students agreed that bacteria are becoming resistant, still only 36.5% correctly identified that unnecessary use of antibiotics can likely make it not to work. However, a higher proportion of students (82.5%) agreed that the more we use antibiotics, the more likely it will not work.

Table 2: Percentage of students who answered correctly to questions regarding knowledge about antibiotic use

Knowledge about antibiotic use	Number (n = 320)	Percentage (%)	95% CI
Do you know what antibiotics are?	292	91.3	88.2-94.4
Antibiotics can kill bacteria	276	86.3	82.5-90.1
Antibiotics can kill virus	80	25.0	20.3-29.7
Antibiotics can kill useful bacteria on the skin and stomach	151	47.2	41.7-52.7
Bacteria are becoming resistant to antibiotics	190	59.4	54.0-64.8
Unnecessary use of antibiotics can likely make it not to work	117	36.6	31.3-41.9
The more we use antibiotics, the more likely it will not work	264	82.5	78.3-86.7
Antibiotics treatment should always be completed	151	47.2	41.7-52.5

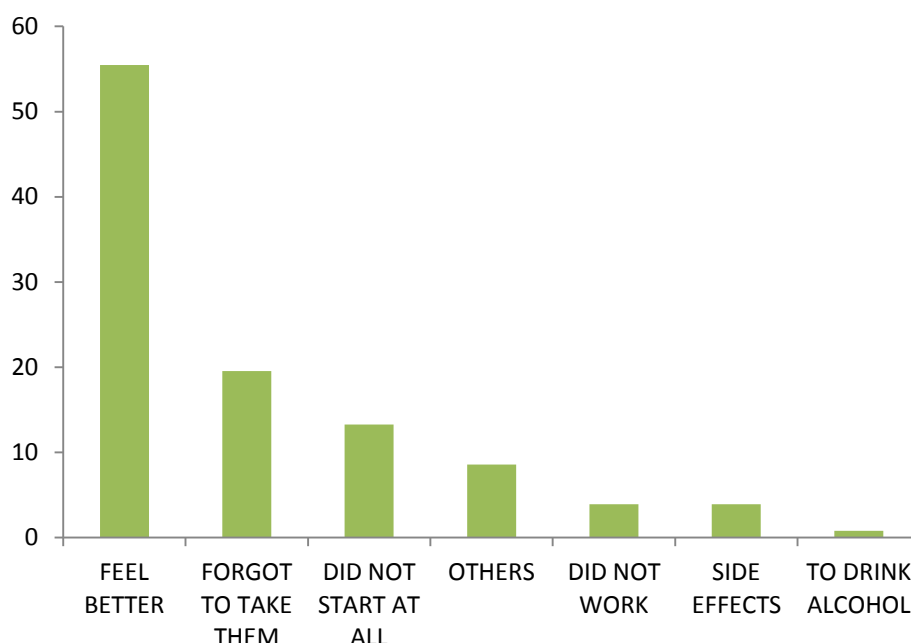
Assessing the participant’s attitude towards antibiotics use, more than half of the participants (51.9%) have taken antibiotics within the last six months while only 43.1% completed the last antibiotics prescribed to them. When asked the reason for not finishing the last antibiotics course prescribed, 55.5% reported that it was because they felt better. 19.5% forgot to take them, 13.28% did not start the course at all while 3.91% reported that they did not work. 3.9% stopped their treatment because of side effects, 8.6% because of other reasons not listed while less than 1% did not finish their course in order to drink alcohol. Nearly two-thirds of the students (61.3%) agreed that they needed to see a

149 doctor before taking an antibiotic however 43.8% expects the doctor to prescribe an antibiotic when
150 they are down with common cold or cough.

151 **Table 3:** Attitudes to antibiotics usage

Attitude to antibiotics use	Yes n (%)	No n (%)	Unsure n (%)
Took antibiotics within the last six months	51.9	41.0	7.2
Completed the last antibiotics prescribed	43.1	40.0	17.2
I need to see a doctor before taking antibiotics	61.3	32.5	6.3
I expect my doctor to prescribe antibiotics for me when I am down with cold	43.8	42.8	13.4

152

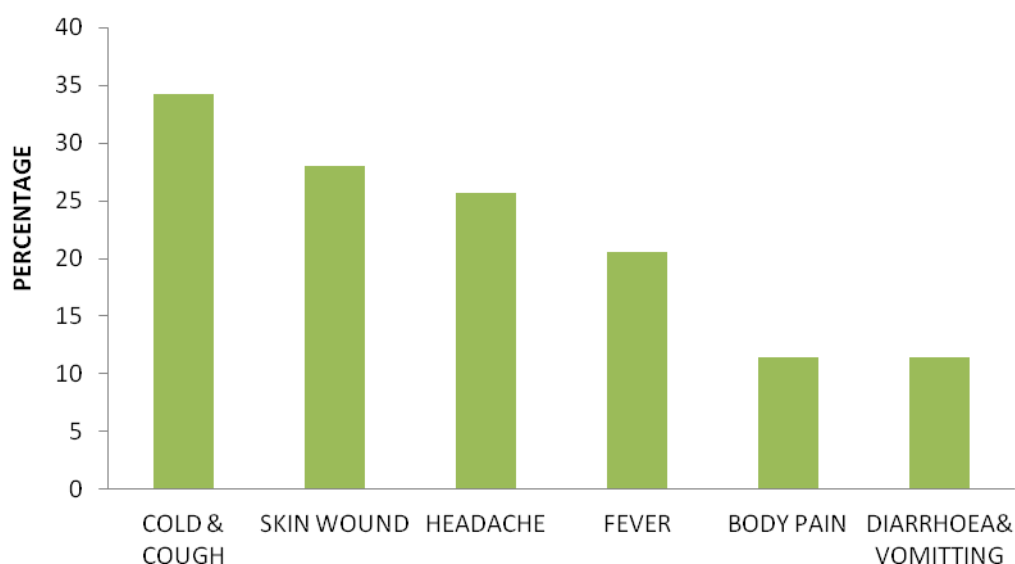


153

154 **Figure 1:** Reasons for not completing the dose of antibiotic

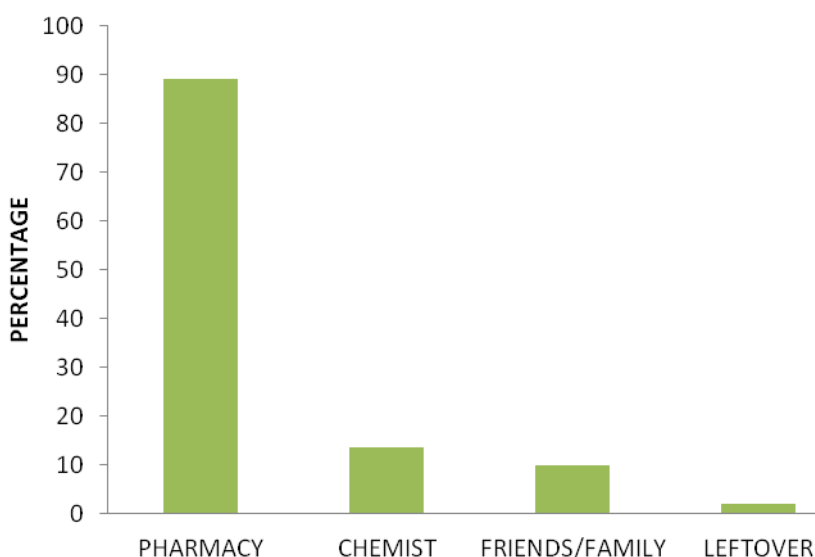
155 Pertaining to respondents practices towards antibiotics use, one hundred and eighty nine (59.1%)
156 students reported that they had taken an antibiotic prior to the study without a medical prescription or
157 consultation. Among those that practised self-medication, majority took ampiclox™, a fixed dose
158 combination of ampicillin and cloxacilin (76.5%); ampicillin (47.3%), amoxicillin (28.4%) and
159 ciprofloxacin (26.8%) while some mentioned anti-malarial as antibiotics (8.6%). Most of these
160 antibiotics were taken for cold and cough (34.3%) and 28% were taken in order to treat skin wounds.
161 Others reasons stated by participants for taking antibiotics without a doctor's advice are headache
162 (25.7%), fever (20.6%), body pain (11.4%) and diarrhoea and vomiting (11.4%). Figure 1 shows the

reasons for self-medicating among respondents. While analysing the source of antibiotics for self-medication as shown in figure 2, the result showed that 89.1% of participants who practiced self-medication obtained the antibiotics from private pharmacies, 13.7% were from patent medicine stores (Chemists). Similarly 10% stated they received antibiotics from family and friends while only 2.1% were from leftover antibiotics.



168

169 **Figure 2:** Symptoms associated with self medication



170

171 **Figure 3:** Sources of antibiotics for self medication

172 Discussion

173 Antibiotics resistance is a growing menace and presents a significant public health problem
174 worldwide. Presently, little is known about the knowledge of antibiotic use and resistance in Africa
175 and in particular, Nigeria. This study presents vital data on the level of knowledge, behaviour and
176 practices of non-medical students to antibiotics use and the health problem of antibiotics resistance in
177 Uyo, Nigeria.

178 Overall, poor knowledge scores on antibiotic usage and resistance were reported among slightly more
179 than two-third of the respondents indicating a high level of misunderstanding of antibiotics usage and
180 resistance. The age and year of study were found to be major predictors of low knowledge among
181 participants as indicated by their p value = <0.0001 . Although majority of the respondents claimed
182 they knew what antibiotics are, just few could answer accurately if antibiotics are effective against
183 viruses. There is a general false belief that antibiotics can be used to treat all kinds of infections. This
184 inadequate knowledge about the use of antibiotics correlates with findings from previous studies
185 assessing the knowledge of undergraduate students from Nigeria [8, 12] and other countries [10].
186 However, a slightly higher knowledge was reported in studies among students in the medical
187 departments [13]. The present study also showed poor knowledge of the factors responsible for
188 antibiotics resistance. Only, a small proportion of the participants agreed that unnecessary use of
189 antibiotics can lead to resistance and that antibiotics treatment should be completed. These findings
190 clearly show the need for a better explanation of the differences between bacteria and virus in future
191 public health campaigns. Furthermore there is need for focused public education on antibiotics
192 effectiveness and resistance in order to avoid misconceptions.

193
194 With regards to attitude to antibiotics use, 51.9% of the participants have taken antibiotics within the
195 past 6 months, however more than half of the students did not the complete their treatment course as
196 prescribed or were not sure if they did. Most of them stopped because they felt better while some
197 forgot to take them. This negative attitude to antibiotic use can further worsen the emergence and
198 spread of antimicrobial resistance in Nigeria hence putting the patient at risk of relapse with resistant
199 bacteria. Furthermore, it is widely known that inappropriate use such as incomplete antibiotics therapy
200 can lead to the emergence of antibiotics resistance. In this study, majority (61.25%) of the students
201 agreed that they needed to consult a doctor before taking an antibiotic which is in agreement with
202 other studies. In contrast, a greater proportion of the participants expects the doctor to prescribe an
203 antibiotics when down with common cold. Patient's expectation and pressure are often the drivers for
204 antibiotic prescribing by physicians leading to unnecessary prescribing [14].

205

This present study reports that about one in two of the study population had self-medicated prior to the study. This is similar to studies from Nigeria [15-17]. This practice is mostly enhanced by the ease of purchase of antibiotics over the counter without a physician's prescription in Nigeria even though antibiotics are by Nigerian law and regulation classified as prescription only Medicine. The sales of medicines are under-regulated in Nigeria leading to a high incidence of self-medication practices in the country and consequently adverse effects and antimicrobial resistance. Interestingly, most of the antibiotics used by respondents are the penicillins such as ampicillin, amoxicillin and especially oral penicillins (which are sensitive to β -lactamases) and ciprofloxacin, a fluoroquinolone. High incidence of bacteria resistance to this class of medicines has been reported in the country [18-19]. This self-medication practice might be the contributory factor to the rise in incidence rates of resistance observed among penicillins and emerging reports of resistance among ciprofloxacin. Common cold, cough and catarrh were the major symptoms that were treated with antibiotics without consultation of a physician. This was followed by skin wounds and headaches. Private pharmacies were the major source of antibiotics for self-medication. This result is in agreement to several Nigerian studies which suggest that people obtain the medicines without consulting a physician mainly from community pharmacies [12, 16]. Participants also purchased antibiotics from patent medicine stores (chemists) operated by non-pharmacists while some received from friends and leftover antibiotics. In a bid to maximise profit, antibiotics are often sold as over the counter without restrictions in Nigeria. This dangerous practice can also worsen the spread and problem of antibiotic resistance.

To decrease indiscriminate use of antibiotics by the public, adequate awareness and education on the appropriate uses of antibiotic and hazard of antibiotics misuse should be carried out. Patient education can be achieved by individualized counselling, the use of pamphlets, workshops and community wide education. Healthcare providers such as doctors and pharmacists play important role in ensuring appropriate drug use, patient education and counselling. This study also highlights the need for strong enforcement of regulatory policies on drug supply and distribution and the sale of antibiotics in Nigeria.

Study Limitations

There are certain limitations which should be taken into account while interpreting the findings of this study. They include the use of convenience sample of study participant which may be associated with selection bias as some students may be missed or over-selected. Also, the use of self administered question has some limitations such as recall bias because it depends on the information provided by respondents which may result in over reporting or under reporting.

Conclusion

This study substantiates that limited knowledge of antibiotic use and resistance exists among university students in Uyo, Nigeria although majority were aware antibiotics are used to treat bacterial infections. Furthermore, it suggests a high level of antibiotics misuse in the form of non-adherence to

prescribed dose of antibiotics and self-medication with antibiotics mainly to treat respiratory symptoms. Therefore, sustained health education for health workers and public health awareness strategies should be the key interventional method to improve behaviour and change perception. Also, antibiotic sales should be strictly regulated to prevent indiscriminate use of medicine.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

REFERENCES

1. Adisa R, Fakeye TO, Aindero VO. Evaluation of prescription pattern and patients' opinion on healthcare practices in selected primary healthcare facilities in Ibadan, South-Western Nigeria. *African Health Sciences*. 2015; 15 (4):1318-1329. doi:10.4314/ahs.v15i4.35.
2. Ofori-Asenso R, Brhlikova P and Pollock A.M. Prescribing indicators at primary health care centers within the WHO African region: a systematic analysis (1995–2015). *Biomed central Public Health*. 2016; 16: 724
3. Truter I. Antimicrobial prescribing in South Africa using a large pharmacy database: a drug utilisation study. *South Afri journal infect dis* 2015; 30: 52-56
4. Van Boeckel T.P , Brower C., Gilbert M , Grenfell B.T, Levin S.A, Robinson T.P, Teillant A and Laxminarayan R. Global trends in antimicrobial use in food animals, *Proceedings of National Academy Science U.S.A*. 2015; 112(18): 5649-54
5. O' Neil J. Antimicrobial Resistance: Tackling a crisis for the Health and wealth of Nations. *Review on Antimicrobial resistance* (December). 2014 London
6. Akinyandenu O and 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.
7. Abu-H M, Hussam A, Jameel H, Oday Al-M; Ahmad Al-Zu'bi; Abu-H W, Mohammed Al-S .Antibiotics Use and Misuse among University Students in Jordan. *Bull. Env. Pharmacol. Life Sci.*, 2015; 4(5): 62-71
8. Sanya T, Titilayo O, Adisa R, Segun J. Use of antibiotics among non-medical students in a Nigerian university. *African Health Sciences*. 2013;13(4):1149-1155. doi:10.4314/ahs.v13i4.41.
9. World Health Organization (WHO).Antimicrobial resistance: *Global Action Plan on Antimicrobial Resistance*. 2015, Geneva [accessed june 20, 2017].

10. Awad A.I and Aboud A.E. Knowledge, Attitude and Practice towards antibiotic use among the public in Kuwait. *PLoS One* 2015; 10(2): e0117910
11. Huang Y, Gu J, Zhang M, Ren Z, Yang W, Chen Y,Fu Y,Chen X, Cals JWL,and Zhang F. Knowledge, attitude and practice of antibiotics: a questionnaire study among 2500 Chinese students. *BMC Med Edu.* 2013; 13:163.
12. Auta A, Banwat S.B, David S, Dangiwa D.A, Ogbole E and Tor-anyiin A.J. Antibiotics use in some Nigerian communities: Knowledge and attitudes of consumers. *Tropical journal of Pharmaceutical Research.*2013;
13. Scaioli G, Gualano MR, Gili R, Masucci S, Bert F, Siliquini R. Antibiotic Use: A Cross-Sectional Survey Assessing the Knowledge, Attitudes and Practices amongst Students of a school of Medicine in Italy. *PLoS ONE.* 2015; 10(4): e0122476. <https://doi.org/10.1371/journal.pone.0122476>
14. Gaarslev, C., Yee, M., Chan, G., Fletcher-Lartey, S., & Khan, R. A mixed methods study to understand patient expectations for antibiotics for an upper respiratory tract infection. *Antimicrobial Resistance {&} Infection Control.*2016; 5(1), 39. <https://doi.org/10.1186/s13756-016-0134-3>
15. Musa Y, Awosan K.J, Ibrahim M.T.O, Abdullahi Z, Jafaar M.M, Peter G, Anthony O, Isah B.A. Knowledge and Practice of Self-Medication among Undergraduate Students of Usmanu Danfodiyo University, Sokoto. *Ann. Int. Med. Den. Res.* 2016;2(1):83-8.
16. Idongesit J, Unyime E and Asuquo I. Self-medication among pharmacy undergraduates in the University of Uyo, Nigeria. *American Journal of Pharmacy & Health Research* 2016, 4(10): 48-58
17. Zhu X, Pan H, Yang Z, Cui B, Zhang D, Ba-Thein W. Self-medication practices with antibiotics among Chinese university students. 2016 *Public health.* 130: 78-83.
18. Onyeagwara N, Obasuyi O, Ottih I. and Akerele J.O. Nasal carriage of Methicillin Resistant *Staphylococcus aureus* among hospitalized otorhinolaryngological patients in Benin City, Nigeria. *Archives of International Surgery.*2014; 4: 99-103
19. Odimayo M.S, Kadijat J.A, Nwadioha S.I and Olabiyi O. E. Antibiotics Profile of Urinary Pathogens in a Tertiary Hospital, in Ekiti State, Nigeria. *International Journal of Current Microbiology and Applied Sciences.*2016; 5(9): 779-787.

312 ANTIBIOTICS_QUESTIONNAIRE

313 SECTION A

314 AGE:

315 15-24: [] 25-30: [] 31-40: [] 40 and above: []

316 GENDER:

317 MALE: []

318 FEMALE: []

319 YEAR OF STUDY:

320

321 SECTON B: KNOWLEDGE ABOUT ANTIBIOTICS USE

		YES	NO	NOT SURE
1.	Do you know what Antibiotics are?			
2	Can Antibiotics treat bacterial infection?			
3	Can antibiotics treat viral infections?			
4	Do you think that bacteria are becoming resistant to antibiotics?			
5	Do you think that unnecessary use of Antibiotics can likely make it not to work			
6	The more we use Antibiotics, the more likely it will not work			
7	Should antibiotics dose/treatment always be completed?			
8	Can antibiotics kill the useful bacteria on the skin and stomach?			

322

323 SECTION C. ATTITUDE TO ANTIBIOTICS USE

324 1. Have you ever been prescribed antibiotics in the last 6 months?

325 A. Yes []

326 B. No []

327 C. Not Sure []

328

329 2. Did you complete the **last** antibiotics prescribed to you?

330 A. Yes []

331 B. No []

332 C. Not Sure []

333 (Please skip 3 and answer 4, if your answer is YES in above question)

334 3. If **NO**, what were your reasons? Because;

335 A. You feel better []

336 B. You forgot to take them []

337 C. You did not start the drug at all []

338 D. They did not work []

339 E. To be able to drink alcohol []

340 F. Side effect []

341 Others (please specify):

342 4. Do you think you need to see a doctor before taking an antibiotic?

343 A. Yes []

344 B. No []

345 C. Not Sure []

- 346
- 347 5. Have you ever received antibiotics from relatives or friends without seeing a doctor?
- 348 A. Yes []
- 349 B. No []
- 350 C. Not Sure []
- 351
- 352 6. Do you expect your doctor to prescribe antibiotics for you when you are down with cough
- 353 and catarrh?
- 354 A. Yes []
- 355 B. No []
- 356 C. Not Sure []
- 357
- 358 7. Have you ever taken antibiotics without being told to do so by a **doctor**?
- 359 A. Yes []
- 360 B. No []
- 361 C. Not Sure []
- 362
- 363 8. If **YES**, which complaint did you use the antibiotics to treat without seeing a **doctor**?
- 364 A. Headache []
- 365 B. Fever []
- 366 C. Cold, cough and Catarrh []
- 367 D. Body Pain []
- 368 E. Skin wound []
- 369 F. Frequent stooling and vomiting []
- 370
- 371 9. Please write down the name(s) of antibiotics you have ever taken without seeing a doctor?
- 372
- 373 A.
- 374 B.
- 375 C.
- 376 D.
- 377
- 378 10. Where do you usually get your antibiotics without doctor's prescription?
- 379 A. Pharmacy []
- 380 B. Chemist Shop []
- 381 C. Street Hawkers []
- 382 D. Friends or Family []
- 383 E. Leftover antibiotics []
- 384 Others (Please specify):

385

386