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ORIGINAL RESEARCH

## Knowledge and Opinion of Patients on Pharmacists' Counselling of Antibacterial Usage in Ogun State Nigeria

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### Abstract

**Background:** The relief from the high morbidity and mortality of the pre antibacterial era is being threatened by antibacterial resistance. This has been traced to irrational antibacterial use probably due to lack of proper counselling. In Nigeria, there is scarcity of study on impact of pharmacists' counselling on patients' knowledge of antibacterial use. This study therefore assessed patients' knowledge and opinion of antibacterial use due to pharmacists' counselling.

**Methods:** The study was a cross-sectional study among patients with antibacterial prescription dispensed at the outpatient department of seventeen government-owned secondary health care facilities in Ogun state of Nigeria. Consecutive sampling was used to administer a pre-tested questionnaire-guided interview to 409 patients determined by Raosoft sample size calculator. Descriptive statistics such as frequency, percentage and mean  $\pm$  SD was used to summarize the data. Chi-square was used to investigate association between socio-demographic characteristics and patients' response.

**Results:** One hundred and fifty-four (37.7%) of the patients were males, 248 (60.6%) were not aware of presence of antibacterial drug(s) in their regimen, 247 (60.4%) were not able to identify the antibacterials while 353 (86.3%) and 390 (95.4%) claimed not be counselled on the use of the antibacterials in relation to meals and side effects respectively. Only 100 (24.4%) had a score  $\geq$  70% implying good knowledge. Two hundred and eighty four (69.4%) believed that pharmacists should be responsible for antibacterial counselling and 226 (55.3%) rated the pharmacists' counseling as being good (70-100%).

**Conclusion:** Patients' knowledge of antibacterial usage was poor despite their good opinion about counselling by pharmacists. Most of the patients were not aware and unable to identify antibacterial drugs in their regimen. It is important that pharmacists take the issue of patients-centered approach in antibacterial counselling very serious. Training of pharmacists on antibacterial counselling is hereby recommended

**Key words:** Patients. Antibacterials, Knowledge, Opinion, Counselling

## INTRODUCTION

Globally, the increase in the incidence of antibacterial resistance has been mostly attributed to the worldwide irrational use of antibacterial agents within and outside the hospitals<sup>1, 2</sup>. The great relief experienced in medical practice in the management of infectious diseases and related ailments is being seriously threatened by the insurgence of antibacterial resistance.<sup>3, 4</sup> Antibacterial resistance is the loss of efficacy of antibacterial agent against initially susceptible bacteria. Inappropriate prescriptions, dispensing and usage of drugs including antibacterials is said to be over 50.0%<sup>5,6,7, 8, 9</sup>. The continual efficacy of antibacterial agents is under a great threat mainly due to antibacterial misuse. The challenge of irrational antibacterial use is worldwide but it is more pronounced in developing countries such as Nigeria<sup>8,10</sup>. Professionals and patients are involved in irrational drug use at various stages. Physicians, pharmacists, nurses, laboratory scientists and other health professionals contribute to irrational antibacterial use at the point of diagnosis, selection, prescription, counselling and administration. Patients on the other hand are involved in self medication, use for wrong indication and incorrect use<sup>7,11,12</sup>. Antibacterials are mostly affected by the outcome of irrational drug use because of the possibility of resistance which is transferable to other victims. Other consequences

of irrational antibacterial use include: adverse reactions, increase cost of treatment, hospitalization and increase morbidity and mortality<sup>6, 8, 9, 13</sup>. Resistance and cross-resistance has been experienced among classes of antibacterials<sup>14</sup>. The irrational use of antibacterials by patients may be due to lack of knowledge of rational antibacterial use. Effective antibacterial counselling is expected to improve patients' knowledge, compliance and enhance therapeutic outcome<sup>4,15,16,17</sup>. Pharmacists are well placed to counsel patients on proper antibacterial use. Professional expertise provided by pharmacists during counselling has the potentials of reducing therapy cost, preventing unnecessary hospitalization and improving therapeutic outcome<sup>12, 18</sup>. Pharmacists have been identified to have important responsibility to assist in the war against antibacterial resistance. Their professional setting in health care makes them most relevant at raising awareness on antibacterial resistance and acting as agent of solution for rational antibacterial use<sup>19, 20</sup>. Pharmacist-directed stewardship programme have been shown to improve treatment outcome<sup>20, 21</sup>. Pharmacists should endeavour to raise patients' awareness and ensure proper counselling that will promote rational antibacterial usage<sup>16</sup>. In Nigeria, evidence based research to ascertain patients' knowledge and opinion on rational antibacterial use as a result of pharmacists' counselling is scarce. This study therefore assessed the

impact of pharmacists' counselling on patients' knowledge of rational antibacterial use. Patients' opinion on pharmacists' antibacterial counselling was also assessed.

## METHODS

The current study was a cross sectional study among patients with antibacterial prescriptions dispensed at the outpatients pharmacy of seventeen government-owned secondary health care facilities in Ogun state of south west Nigeria. These were the only government-owned secondary healthcare facilities with the outpatient pharmacy under the supervision of at least a registered pharmacist in Ogun state at the time of the study.

The sample size was determined by Raosoft sample size calculator<sup>22</sup>. The population size was calculated from the outpatient record at the pharmacy departments of the selected hospitals and found to be 10830. Setting the margin of error at 5%, confidence level 95% and response distribution at 50% the sample size was given to be 372. Adjusting the sample size for non-response, 10% (37) was added:  $372 + 37 = 409$ .

### Ethical Approval

Ethical approval for the study was granted by the joint University of Ibadan/University College Hospital (UI/UCH) Health Research and Ethics Committee with approval number UI/EC/15/038. Permission was also obtained from the pharmacy department of Ogun State Health Management Board with approval

number: SHB/2146/DPS/201 and the Head of Department of Pharmacy of each hospital.

#### Validation and Pretest of Data Collection Instruments

The questionnaire-guided interview was pretested for face and content validity. The questionnaire was discussed with two lecturers (pharmacists) at the department of clinical pharmacy and pharmacy administration, University of Ibadan. These are knowledgeable in construction of questionnaires in similar surveys. Their contributions led to rewording of some questions after which the content was considered satisfactory.

A pre-test of the questionnaire was carried out at Sacred Heart Hospital, Lantoro, Abeokuta, Ogun state of Nigeria which is also a secondary health care institution like those selected for the study. Fifty-five patients participated in the pre test. Findings from the pre-test were used to adjust the questionnaire accordingly. The result of the pre test was not included in the final analysis

#### Reliability of Data Collection Instrument

The reliability of the questionnaire was established by applying Cronbach's Alpha test in the SPSS software. The value of Cronbach's Alpha was found to range from: 0.723 to 0.743, Cronbach's Alpha value  $\geq 0.7$  is generally acceptable by researchers as satisfactory<sup>23</sup>

#### The Questionnaire

The questionnaire-guided interview comprised: (a) demographic characteristics which include: gender, age, marital status, educational qualification

and occupation. (b) knowledge questions to assess the patients on antibacterial use (c) questions verifying the opinion of patients about the counselling received from the pharmacist, and (d) patients' rating of pharmacists' counselling.

#### Data collection procedure

The patients that met the inclusion criteria and consented to participate in the study were interviewed using the questionnaire-guided interview. This was carried out on Monday to Friday between 7.30am to 3.30pm from July to September 2017.

Convenient sampling method was adopted until the target sample was reached. Eligible patients who agreed to participate in the study were interviewed based on the patients' questionnaire. This was done through one to one interaction between the investigator or his trained assistants and the patients immediately after being counselled by the pharmacists. Patients or their care giver being interviewed were engaged in a private environment free from interference from the counselling pharmacist or other patients. This was to ensure that the discussion neither influenced subsequent pharmacists' counselling nor modified other patients' responses. Participants were assured of the confidentiality and anonymity of their responses.

#### Data Processing

The data obtained were coded and entered into the SPSS version 20. Patients' knowledge was computed by allotting a score of 1 to a correct response and a score of 0 to wrong

response. A cut off of % knowledge score of  $\geq 70\%$  was regarded as good knowledge while  $< 70\%$  was assumed to be poor knowledge. This was adopted from earlier study<sup>24</sup>

Individual Patient's Percentage knowledge score =  $(\text{Score obtained} \div \text{total obtainable score} \times 100)$ .

For the patients rating of pharmacists' counselling, Excellent was allocated a score of 5, Very good a score of 4, good a score of 3, Fair a score of 2 and Poor rating was allocated a score of 1.

% Rating =  $(\text{Rating} \div \text{Maximum obtainable rating}) \times 100$

% rating  $< 70\%$  was considered poor counselling while  $\geq 70\%$  was viewed to be good counselling adopted from earlier study<sup>18</sup>

#### Data Analysis

The data obtained from the questionnaire were arranged, coded and entered into Statistical Package for Social Sciences (SPSS) version 20 for management and analysis. Descriptive statistics such as frequency, percentage and mean  $\pm$  standard deviation were used to summarize the data and evaluate distribution of responses to the study variables. Test of association between patients' socio-demographic characteristics and knowledge of antibacterial use was determined using Chi square ( $X^2$ ) test. P-value  $< 0.05$  was considered to be statistically significant.

#### RESULT

Distribution of Patients in the selected Study Sites

Four hundred and nine outpatients with prescription of at least one antibacterial drug, dispensed at the outpatient pharmacy of one of the study sites participated in the

study. Ogun state is divided into three senatorial districts. There were more of the patients 168 (41.1%) that participated in Ogun Central senatorial district than in the other two districts which were: Ogun East 146 (35.7%) and Ogun West 95 (23.2%).

#### Socio-demographic Distribution of Patients

The review revealed more females 255 (62.3%) than males 154 (37.7%). The mean age was  $43.9 \pm 14.9$  and the age range was from 19 to 87 years. Two hundred and ninety five (72.1%) were married.

Majority, 132 (32.3%) were traders while 89 (21.8%) either had primary six leaving certificate or no formal education. Details of the socio-demographic distribution of the patients are presented in Table 1.

Table 1: Socio – demographic Characteristics of Patients (N = 409)

Variables	N (%)
Male	154 (37.7)
Female	255 (62.3)
18 – 40	178 (47.5)
41-60	175 (42.8)
61 – 80	47 (11.5)
>80	9 (2.2)
Mean Age $\pm$ SD	43.89 $\pm$ 14.89
Age Range	19 -87 years
Single	114 (27.9)
Married	295 (72.1)
Primary	89 (21.8)
Secondary	131 (32.0)
Tertiary	189 (46.2)
Occupation of patients participants	
Trading	132 (32.3)
Civil Servant	95 (23.2)
Artisan	89 (21.8)
Student	51 (12.5)
Retired civil servants	16(3.9)
Farming	14 (3.4)
Medical/Health worker	12(2.7)

#### Class of Antibacterials Dispensed to the Patients



The penicillins, 149 (36.4%) were the most frequently prescribed and dispensed class of antibacterial agents followed by the Cephalosporins 135 (33.0%). Details of the classes of antibacterials dispensed to the patients are presented in Figure 1.

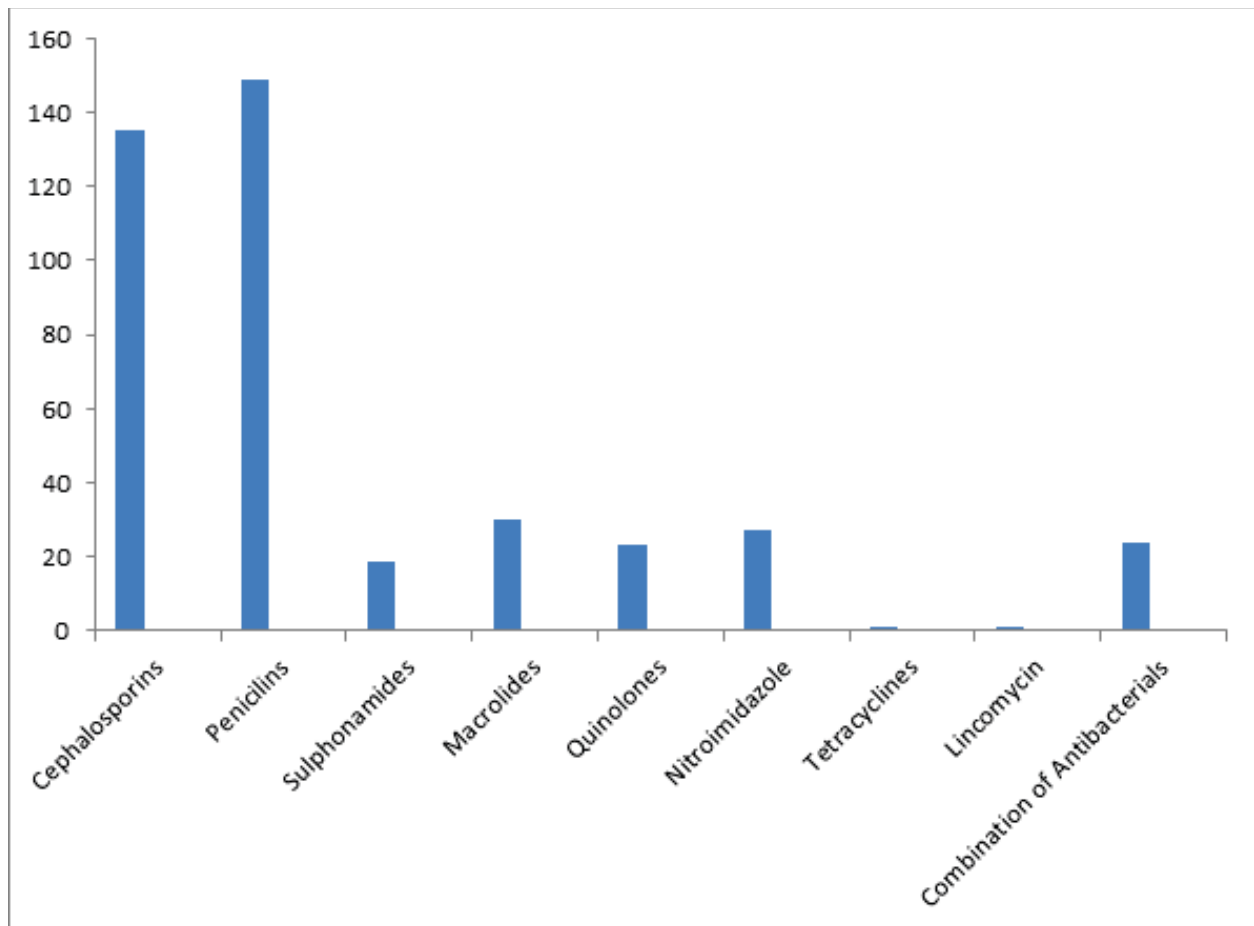


Fig. 1: Classes of Antibacterials Dispensed to Patients (N= 409)

### Patients' knowledge of Antibacterial Usage

Out of the 409 patients that participated in the survey 162 (39.6%) were aware that antibacterial drug(s) was dispensed to them. Eighty-three (20.3%) of the patients were informed by the pharmacists that they had antibacterial drug(s) in their regimen. One hundred and fifty-six (38.1%) were able to correctly identify the antibacterial drug(s) amidst other drugs they received. Good knowledge depicted by a score  $\geq 70.0\%$  of antibacterial usage was displayed by 100 (24.4%) of the patients. Details of patients' knowledge of antibacterial counselling received from pharmacists are as in Table 2.

Table2: Patients' Knowledge of Antibacterial Usage (N=409)

Statements	Yes N (%)	No N (%)
Were you aware of presence of antibacterial drug(s) in your prescription?	162 (39.6)*	247 (60.4)
The Pharmacist informed me about the presence of antibacterial agent in my medication	83 (20.3)*	326 (79.7)
Patient was able to correctly identify the antibacterial drug(s) among the drugs received? ( <i>patient asked to display and identify the antibacterial drug amidst others</i> )	161 (39.4)*	248 (60.6)
Antibacterials should be used at regular intervals	38 (9.3)*	371 (90.7)
Patients had correct knowledge of how long to be on the antibacterial drug(s)?	105 (25.7)*	304 (74.3)
Patients claimed to be counseled by pharmacist and were able to explain correctly how to use the antibacterial drug in relation to meals	56 (13.7)*	353 (86.3)
Patients received counselling from the pharmacist and were able to recollect food to avoid while on the antibacterial drug(s)	56 (13.7)*	353 (86.3)
Patients asserted to pharmacist's counselling and were able to rightly recall drugs to avoid while on the antibacterial(s)	82 (20.0)*	327 (80.0)
The pharmacist counselled me to report at the hospital in case of delay in perceiving relief from the symptoms of the ailment within a specified time	156 (38.1)*	253 (61.9)
<b>Mean knowledge score</b>		2.2 ± 0.2
<b>Cut off of patients' % score on knowledge of antibacterial use &lt;70%</b>	<b>N (%)</b>	<b>Remark</b>
	309 (75.5)	Poor Knowledge
	100 (24.4)	Good Knowledge

Maximum obtainable score = 9, % individual knowledge score = (score obtained by individual ÷ total obtainable score) × 100. \* = correct response

### Patients' Knowledge of Drugs at Home and Antibacterial Usage

Two hundred and fifty-one (61.4%) claimed not to have any drug at home or at hand before the present prescription. Nineteen (4.6%) had antihypertensives and 18 (4.4%) asserted to have antibacterials at home. Nineteen (4.6%) confirmed to receive counsel on the side effects of the antibacterial agent while 17 (4.2%) received counsel on necessity of completing the course of therapy despite relief from the symptoms of ailment under treatment (Table 3).

**Table 3: Patients Knowledge of Drugs at Home and Antibacterial Usage (N = 409)**

Variables	Response	N (%)
The drug(s) I have at home/at hand are:		
Paracetamol/Artemether/Lumefantrine		58 (14.2)
Paracetamol, Ferrous sulphate, Vit. C, Vit. B Co.		29 (7.1)
Ibuprofen, Diclofenac		8 (2.0)
Moduretic, Amlodipine, Nifedipine, Methyldopa		18 (4.4)
Ampiclox, Amoxicillin, Co-trimoxazole, Metronidazole		19 (4.6)
Metformin, Glimepiride		4 (1.0)
Lamivudine, Nevirapine		21 (5.1)
Mist. Mag. trisilicate		1 (0.2)
I have no drug at home		251 (61.4)
	Yes	20 (4.9)
	No	389 (95.1)
The pharmacist counselled me to:	Continue with the drug at home	21 (5.1)
	stop the use of the drug at home	13 (3.2)
I was given no counsel on the drug at home		375 (91.7)
Pharmacist counselled me on likely side effect of the antibacterial drug	Yes	19 (4.6)
	No	390 (95.4)
In case of side effects, pharmacist counselled me to:	report to your doctor	11 (2.7)
	report to your pharmacist	3 (0.7)
	ignore the side effect	5 (1.2)
I was not counseled on what to do in case of side effect		390 (95.4)
If I missed any dose, pharmacist counselled me to:	take it immediately you remembers	18 (4.4)
	wait until next due time	2 (0.5)
I was not counseled on missed dosage		392 (95.8)
Pharmacist counseled me to use the antibacterial drug completely even if there is apparent relief	Yes	17 (4.2)
	No	392 (95.8)

Mag = magnesium, Vit = vitamin

### Patients' Opinion and Rating of Counselling Received from Pharmacists

The survey confirmed that 284 (69.4%) of the patients were of the view that counselling on drugs is best done by pharmacists. Ninety-three (22.7%) preferred to see the physicians for further counselling after being attended to by the pharmacists. Two hundred and twenty-six (55.3%) of the patients rated the counsel received as  $\geq 70\%$ . Details of patients' opinion and rating of pharmacists' counselling are as in Table 4

Table 4: Patients' Opinion and Rating of Pharmacists' Counselling (N = 409)

Statement		N (%)
	Physicians	113 (27.6)
	Pharmacists	284 (69.4)
	Nurses	12 (2.9)
	Physicians are well knowledgeable on drugs	17 (4.2)
	Pharmacists are in charge of drugs	245 (59.9)
	Physicians are the prescribers so they should know better	87 (21.3)
	Physicians are in charge of health care	9 (2.2)
	Pharmacists dispensed the drugs and should give appropriate counsel	39 (9.5)
	Nurses takes care of patients	12 (2.9)
	Yes	93 (22.7)
	No	316 (77.3)
	Doctor asked me to come back	37 (9.0)
	Doctors are friendlier	11 (2.7)
	For better understanding of how to use the drugs	45 (11.0)
	I don't need to see him, I am okay	316 (77.3)
	I am satisfied with the pharmacist's counsel	83 (20.3)
	Pharmacists are better counselors on drugs	52 (12.7)
	I understand the pharmacist's counsel very well	181 (44.3)
	I prefer to see the Doctor	93 (22.7)
How will you rate your satisfaction on the counselling you received from the pharmacist?	<70.0%	183 (44.7)
	$\geq 70.0\%$	226 (55.3)



Mean patients' rating

55.3 ± 15.4

Cut off of patients' rating of pharmacists' counselling

Remark

< 70%

Poor counselling

183 (44.7)

≥70%

Good counselling

226 (55.3)

Maximum Rating = 100.0%

### Association between Socio-demographic Characteristics and Patients' Knowledge of Antibacterial Usage

There was no significant association between the socio-demographic characteristic and patients' knowledge of antibacterial usage. Patients' opinion of counselling received from pharmacists also indicated no significant association with their demographics.

## Discussion

### Patients' Knowledge of Antibacterial Usage

Generally the patients' knowledge of antibacterial use from this study was poor. An earlier study conducted in Malaysia, on the effectiveness of Pharmacists' intervention in improving patients' knowledge and attitude towards antibiotic usage reported 36.8% of the patient counselled to have good knowledge<sup>18</sup>. Majority of the patients in the present study claimed not to be counselled on vital issues of antibacterial use. Patients' awareness and ability to identify antibacterial agents among other drugs dispensed to them is a step to appropriate usage. This is likely to make them pay special attention to pharmacists' counsel on the antibacterials and will possibly improve compliance with dosage regimen. Only 24.2% had good knowledge. Another study on public knowledge and

awareness related to antibiotic use and resistance in Sweden reported a somewhat higher knowledge of 54.7%<sup>25</sup>. The difference observed here may be due to difference in environment and study approach. The current study revealed low patients' awareness (39.4%) of the presence of antibacterial drugs as part of their medication and only minority (39.6%) were able to correctly identify the antibacterials. The low awareness level shown by patients here is consistent with findings in a study carried out in Israel<sup>26</sup> in which 27.0% of patients were aware of their medication. The low level of patients' antibacterial counselling obtained in this study may be a further confirmation of that reported in developed society. Despite several antibacterial awareness promotions in England, 20.0% of patients in deprived areas were said to receive pharmacists' counselling of drug usage<sup>21</sup>. In the present study, only a minority (20.5%) of the patients claimed

that pharmacists informed them of the presence of antibacterial drug(s) in their prescriptions. In a study of patients' perception, views and satisfaction with pharmacists' role as health care provider in Saudi Arabia, a somewhat higher level (44.6%) of patients' awareness of dispensed antibacterials was reported<sup>27</sup>. The low level of awareness demonstrated by majority of the patients may likely be due to inattention to the pharmacists' counselling or that the pharmacists fail to give appropriate counselling.

From this present study, only 39.6% of the patients were able to identify antibacterial amidst other drugs. This is in contrast with higher proportion of patients that were able to identify dispensed antibacterials in a study of effectiveness of Pharmacists' intervention in improving patients' knowledge and attitude towards antibiotic usage in, Malaysia<sup>18</sup>

Pharmacokinetic profile of drugs

especially oral medications necessitates that drugs be used at regular intervals. This is particularly important for antibacterials. Failure to use antibacterial drugs at the due time may result in gradual decrease of plasma concentration from the minimum inhibitory concentration (MIC) thereby exposing the bacteria to sub therapeutic concentration (STC). Prolonged exposure of bacteria to STC may probably promote development of resistant strains<sup>28</sup>. It is therefore expedient to counsel patients to adhere to regular dosage intervals. Missed dose should be taken immediately patient remembers and necessary adjustment should be made for regular intervals on the subsequent administration. In case the time for the next dose is near, the patient may be counselled to wait till the next due time. From the current study, very few (4.4%) of the patients were counselled on action to take when there is missed dosage. A study of assessment of public knowledge, beliefs and behaviour of antibiotic use in an Omani population reported that 16.0% of the patients were counselled on action to take in case of missed dosage<sup>24</sup>. This contrasted value of 67.4% reported in a study carried out in northern Ethiopia among patients that patronized community pharmacies<sup>29</sup>. The present study confirmed that minority 17 (4.2%) of the patients were counselled on the necessity to complete the course of therapy different from findings from two previous studies<sup>7,11</sup> which reported 47.1% and 50.0% respectively.

Unfortunately, most of the antibacterial agents dispensed to the patients in this study, were of the penicillins and cephalosporins. These are  $\beta$ -lactams which are susceptible to the  $\beta$ -lactamases. This makes them to be rather prone to the incidence of antibacterial resistance. The negative effect of incomplete course of therapy may be more pronounced in these classes of antibacterials.

Co-administration of some antibacterials with food has varying consequences ranging from decreased absorption profile to complete loss of activity. It is therefore necessary to counsel patients on how to use antibacterials in relation to food for those that are affected by food. It is evident from the present study that only 13.7% of the patients claimed to be counselled on antibacterial-food interactions. The result is at variance with 65.3% reported in Ethiopia in a study carried out on patients' medication counselling<sup>29</sup>. The difference here may be as a result of difference in study environment and the changes due to difference in study period. Moreover, the study in Ethiopia was conducted in community pharmacies while the current study was in hospital setting.

Probing into drugs that patients' have at home or at hand is beneficial especially to avoid drug-drug interactions. Keeping left over antibacterial drugs has also been generally viewed to be a pointer to poor compliance and possibility of over dosage due to multiple uses<sup>21, 30</sup>. In the present

study, 19 (4.6%) of the patients claimed to have left over antibacterials, similar to 5.0% reported by a study on knowledge and awareness of the general public and perception of pharmacists about antibiotic resistance conducted among people (living in affluent and deprived areas) and community pharmacists in London<sup>21</sup>. The present study revealed that only 20, (4.9%) of the patients claimed to be counselled on drugs at home.

Antibacterials may sometimes manifest side effects which might make patients unwilling to continue with the treatment. Counselling on likely side effects may aid patients' compliance with regimen. This study showed that most, 390 (95.4%) of the patients were not counselled on likely side effects. This result is similar to that of a study conducted in Israel on patients' knowledge about their medication, in which minority (27.0%) of the patients were aware of side effects related to their medication<sup>26</sup>. Higher proportion (40.8%) of patients counselling on side effects was reported in a study conducted in northern Ethiopia on patients' medication counselling<sup>29</sup>. Patients on antibacterial therapy may sometimes experience delay in perceiving relief of symptoms of ailment under treatment or outright failure of treatment. Prompt report of delayed activity or seemingly failure in experiencing relief will afford the health practitioners the opportunity to reassess therapy options. Patients should therefore be counselled on action to take when there is perceived delay in

antibacterial effectiveness in order for appropriate corrective measure to be taken timely. This study revealed that majority (61.9%) of the patients received no counselling on action to take when delayed antibacterial activity is perceived. The study on medication counselling in northern Ethiopia reported a somewhat lesser value of 46.4 %<sup>29</sup>. The difference may be as a result of difference of exposure of the pharmacists during their training period and the fact that the former study was among community pharmacies while the present study was in the hospital setting.

From the present study, more than half (69.4%) of the patients had the opinion that pharmacists should be responsible for antibacterial counselling. Majority (55.3%) claimed to be satisfied with the counselling received from the pharmacist similar to the study on medication counselling in northern Ethiopia<sup>29</sup>. The present study revealed that 55.3% of the patients rated pharmacists' counselling to be  $\geq 70\%$  which signified good counselling. The patients' good rating of pharmacists' counselling did not reflect in their knowledge of antibacterial use after being counselled. This may however be a reflection of patients' confidence in pharmacists' counselling. This is a welcome disposition as it points to their willingness to be counselled. Further research work that will involve training of the pharmacists on antibacterial therapy and patients counselling is hereby suggested. The study should include the effect of such training

on pharmacists counselling skill through assessment of patients' knowledge. The patients' desire to be counselled should be viewed by the pharmacists as a challenge and an encouragement to fulfill their counselling responsibility.

### Limitations

Convenient sampling was used to select the patients and this may introduce selection bias. There is the possibility of patients' participation more than once, though effort was made to discourage repeated participation. However this is likely to be negligible as repeated courses of antibacterial treatment is rare as in the treatment of chronic diseases except when there is therapy failure. Patients that did not understand English or Yoruba language were exempted. These were in the minority as almost all the patients attended to understood either of the two languages

### CONCLUSION

Patients' knowledge of antibacterial counselling usage was found to be poor. Patients had good opinion about antibacterial counselling. Majority of the patients were not well counselled despite their willingness to be counselled. Most of the patients were not aware and unable to identify antibacterial drugs in their regimen. This resulted in deficit of patients' knowledge of antibacterial proper usage. Training of pharmacists on antibacterial counselling is hereby recommended. It is important that pharmacists take the issue of

patients-centered approach in antibacterial counselling very serious. They should endeavor to update antibacterial therapy knowledge and improve their counselling skill. Feedback approach should be used to ascertain patients' comprehension of counselling details.

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### REFERENCES

1. Huttner A, Harbarth S, Carlet J. (2013) Antimicrobial resistance: a global view from the World healthcare-Associated Infections Forum. *Antimicrobial resistance and infection control* 2013; 2(1): 31.
2. Mansour O, Al-Kayali R. (2017) Community Pharmacists Role in Controlling Bacterial Resistance in Aleppo, Syria. *Research* . 16 (4): 1612– 1620.
3. Fathi I, Sameh O, Abu-Ollo M. (2015). Knowledge, Attitude and Beliefs Regarding Antimicrobial Therapy and Resistance among Physicians in Alexandria University Teaching Hospitals and the Associated Prescription Habits. *Microbe. Drug Resist. mdr.00 (00):* 1-5.
4. Zahreddine L, Hallit S, Shakaroun S, Al-Hajje A, Awada S and Lahoud N (2018). Knowledge

- of pharmacists and patients towards antibiotic use in paediatrics: a cross-sectional study in Lebanon. *Pharmacy practice* 16(3):1194-1204
5. WHO 1993. How to investigate drug use in health facilities: selected drug use indicators.
6. WHO 2014: Antimicrobial Resistance Global Report on Surveillance. Geneva; Available from: <http://www.who.int/drugresistance/documents/surveillance-report/en>. [Last accessed on 30 Aug 2017]
7. Gualano MR, Scaioli G, Gili R, Masucci S, Bert F and Siliquini R (2015). Antibiotic Use: A Cross-Sectional Survey Assessing the Knowledge, Attitudes and Practices amongst Students of a School of Medicine in Italy. *10(24)*: 2-10.
8. Atif M, Azeem M, Sarwar MR, Shahid S, Javaid S, Ikram H. (2016). WHO/INRUD prescribing indicators and prescribing trends of antibiotics in the Accident and Emergency Department of Bahawal Victoria Hospital, Pakistan. *SpringerPlus*. 5(1):1928. doi: 10.1186/s40064-016-3615-1
9. Amaha ND, Dawit GW, Nuru A & Eyasu HT (2019). [Antimicrobial Resistance & Infection Control](#) volume 8, Article number: 163
10. Ahmadi F, Zarei E. (2017). Prescribing patterns of rural family physicians: a study in Kermanshah Province, Iran. *BMC Public Health*. 17(1):908
11. Asogwa IE, Ofor SJ, and Herbert O (2017). Knowledge, attitude and practice towards antibiotic use among non-medical university students in Uyo, Nigeria. *Journal of advances in medical and pharmaceutical sciences* 15(1):1-11
12. Sakeena, MH. Bennett, AB. Mclachlan AJ. (2018) Enhancing pharmacists' role in developing countries to overcome the challenge of antimicrobial resistance: a narrative review. *Antimicrobial resistance and infection control* 7: 63 <https://doi.org/10.1186/s13756-018-0351-z>
13. Naglaa A, El-Sherbiny EH, Mohamed M (2018). Assessment of knowledge, attitude and behaviour towards antibiotic use in primary health care patients in Fayoum Governorate, Egypt. *Alexandria Journal of Medicine* 54: 535-540
14. Krivoy N and Hadad S (2007). Antibiotics and Cost Patterns in a General Intensive Care Unit. *P. Jarm Pract*. 5(2):67-73
15. Fernando D, Silvio F, Barberato-Filho L, Cruz L and Maria I (2010). Level of patient information on antibiotic use. *Brazilian journal of pharmaceutical sciences* 46 (3): 1984-8250.
16. [Yalda S](#), [Hassan T](#), [Kheirollah G](#), [Naser H](#) and [Mohammadreza J](#) (2016). Role of pharmacist counselling in pharmacotherapy quality improvement; [J Res Pharm Pract](#). 5(2):132-137.
17. Horwood J, Gabriel C, Hay AD. Ingram J. (2016). Primary care clinician antibiotic prescribing decisions in consultations for children with RTIs: a qualitative interview study. *British Journal of General Practice* 2016; 66(614): 207-213 e207-e213 doi: 10.3399/bjgp 16X683821
18. Choudhury P, Zulawati A, Lailatul M, Ong KS and Shahnaz B (2018). Effectiveness of Pharmacists' intervention in improving patients' knowledge and attitude towards antibiotic usage in Klinik Kesihatan Seremban, Malaysia: *International journal of advancement in life sciences research* 1(1):34-42
19. Naomi F, Sue B, Ashiru O (2011). Pharmacists have a critical role in the conservation of effective antibiotics. *The Pharmaceutical Journal* 13(10):1-5
20. Dorothy MC, Kimberly TO and Jason CG (2011). The Pharmacists' role in preventing antibiotics resistance. *U S Pharm* 36 (7): 42 - 49.
21. Mason T, Trochez C, Thomas R and Baber M (2018). Knowledge and awareness of the general public and perception of pharmacists about antibiotic resistance. *BMC public health* 18 ( 1 ) : 5 6 1 4 - 5 6 1 7 <https://doi.org/10.1186/s12889-018-5614-3>
22. Raosoft (2017). Sample size calculator by Raosoft Inc. Available at <http://www.raosoft.com/samplesize.html>.
23. Mohsen T (2011). Making sense of Cronbach's alpha. *International Journal of Medical Education*: 2: 53-55.
24. Jimmy J, Beena J, Al-Gahliya M, Al-Sabahi S, and Ghalya A (2013). A study assessing public knowledge, beliefs and behaviour of antibiotic use in an Omani population. *Oman Medical*

Journal;28 (5): 324-330

25. Andre M, Vernby A, Berg J and Lundborg C. (2010). A survey of public knowledge and awareness related to antibiotic use and resistance in Sweden. *Journal of Antimicrobial Chemotherapy* 65 (6): 1292-1296

26. Hanna K, Nirakoren D and Oran B (2004). Assessment of patient knowledge about their long term therapy. *European journal of nursing* 5(4): 311-316

27. Mohamed Z, Samy F, Alaa M, Hamdy F, Yasser S, Moataz E (2018). Egyptian community

pharmacists' attitudes and practices towards antibiotic dispensing and antibiotic resistance: a cross-sectional survey in Greater Cairo. *Current Medical Research and Opinion*. Doi: 10.80/03007995.2018.1544119.

28. Chris, O. (2016/2017). EMDEX. Drug formulary for Nigeria's Health Professionals. *Anti-infective drugs* 335-558

29. Ayalew E, Seid Y and Agalu A (2014). Knowledge, attitude and practice of patient medication counselling among drug dispensers in Mekele town.

Northern Ethiopia. *International Research Journal of Pharmacy. Pharmacol.* 4(2):28-34

30. Roque F, Soares S, Breitenfeld L, Lopez-Duran A, Figueiras A, and Herdeiro MT (2013). Attitudes of community pharmacists to antibiotic dispensing and microbial resistance: a qualitative study in Portugal. *Int J Clin Pharm* 35 (3) 417-24