



RESEARCH ARTICLE

HEALTHCARE PROVIDERS' PERCEIVED BARRIERS TO EFFECTIVE ADMINISTRATION OF  
PRESCRIBED ANTIBIOTICS TO INPATIENTS IN NATIONAL ORTHOPAEDIC HOSPITAL  
ENUGU NIGERIA

<sup>1</sup>Ujari K. V., <sup>2</sup>Anarado A. N., <sup>3,\*</sup>Chukwu I. J. and <sup>4</sup>Ogu C. O.

<sup>1</sup>Nursing Services Department, National Orthopaedic Hospital, Enugu State Nigeria

<sup>2</sup>Department of Nursing Sciences, Faculty of Health Sciences and Technology, College of Medicine,  
University of Nigeria Nsukka

<sup>3</sup>Department of Medical Laboratory Sciences, Faculty of Health Sciences and Technology,  
College of Medicine, University of Nigeria Nsukka

ARTICLE INFO

**Article History:**

Received 14<sup>th</sup> March, 2018  
Received in revised form  
27<sup>th</sup> April, 2018  
Accepted 20<sup>th</sup> May, 2018  
Published online 28<sup>th</sup> June, 2018

**Key words:**

Stewardship,  
Antibiotic,  
Barriers,  
Inpatients.

**\*Corresponding author**

Copyright © 2018, Humayunn S.I. and Col. V.P. Singh. This is an open access article distributed under the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

Citation: Ujari K. V., Anarado A. N., Chukwu I. J. and Ogu C. O., 2018. "Healthcare providers' perceived barriers to effective administration of prescribed antibiotics to inpatients in national orthopaedic hospital enugu nigeria", *International Journal of Current Research*, 10, (06), 70078-70084.

ABSTRACT

The improper use of antibiotics has led to increased emergence of resistant organisms, making it essential to investigate Healthcare providers' perceived barriers to effective administration of prescribed antibiotics to inpatients in National Orthopaedic Hospital Enugu (NOHE) Nigeria. Study adopted a descriptive cross sectional design. The target population was 344 doctors and nurses, 273 met the inclusion criteria and were involved in the study. Data were collected using questionnaire, items constructed in 4 point Likert type response scale with decision mean score of 2.5. Data were analyzed with the aid of statistical package for social science (SPSS) version 20. The result showed financial constraint as the major patients' barrier (3.4), improper timing as the major healthcare providers' barrier (3.0) and lack of antibiotics stewardship as the major health system barrier (3.2). There was no significant relationship ( $p>0.05$ ) between the professional status, gender and years of experience of the healthcare providers and their perceived barriers to effective antibiotics administration. Patients should be educated on antibiotics use, and encouraged to register with Health Insurance Scheme which is designed to alleviate the financial burden associated with healthcare services. Healthcare providers should administer antibiotics as prescribed and hospital system has to set-up antibiotics stewardship.

INTRODUCTION

Disease prevention, management and treatment require use of different classes of medications. Different medications have been utilized in the Prevention, management and treatment of various disease conditions (Kamaldeen *et al.*, 2013). Antibiotic as one of the commonest classes of medications, since discovery has become one of the most successful drug groups used in medicine. Their therapeutic and prophylactic power was so convincing. Unfortunately, with decade's optimism, improper use of these antibiotics in both human and other animals has led to the appearance and propagation of resistant strains of organisms that endanger their efficacy resulting in high cost of healthcare and prolonged hospitalization (Ibrahim and Saber-Ayad, 2012; Ronald *et al.*, 2015). In Sub-Saharan Africa, this has led to an increased pressure on healthcare providers in their quest to understand and tackle the increased incidence and burden of infections, which has resulted in

readmission and death among patients (Okonko *et al.*, 2009). During surgical orthopedic procedures, administration of antibiotics (pre, intra and post operatively) is a common practice, as well as in nonsurgical cases (John and Obi, 2014). This has significantly achieved prevention of surgical site infections (SSIs), pathogenic eradication, and has stimulated speedy wound healing. In a recent work by Kardas *et al.* (2011) indicated that, the never-ending ever-spiraling race in the discovery of new antibiotics in both developed and developing countries is due to decrease in the efficacy of the existing ones and keep the healthcare providers from losing ground in the battle against infection (Kardas *et al.*, 2005). Antibiotic resistances once established, is not reversible. Strong measures should be implemented to avoid and minimize its development, by promoting appropriate prescription and administration (Ibrahim and Saber-Ayad, 2012). In National Orthopaedic Hospital Enugu (NOHE), antibiotics are prescribed and administered both to surgical and

nonsurgical inpatients. In this study, we intend to find out the barriers to effective administration of prescribed antibiotics from the nurses and doctors, who are directly involved in the administration.

## MATERIALS AND METHODS

The present study adopted a descriptive cross sectional design. This design allows for orderly collection, analysis, interpretation and reporting important factors about the subject on existing situation to explore the association of variables in an effort to gain a better understanding of the phenomena under study (Jackson, 2015). This design was considered appropriate as it has been successfully used in similar study like that of Ugwu, Olibe, Obi and Ugwu (2014).

**Area of Study:** The study was carried out in National Orthopaedic Hospital Enugu. The hospital is situated in Enugu State, one of the States in the Eastern part of Nigeria. Enugu is inhabited mostly by Igbo speaking people. It is located in Enugu North Local Government Area along Abakaliki-Expressway, Abakpa, Enugu Nigeria.

**Study population:** The target populations of study were healthcare providers directly involved in the administration of antibiotics in National Orthopaedic Hospital Enugu (Nurses and Doctors). The total number of the doctors and nurses in NOHE for the study was 344 (i.e. nurses 286 and doctors 58).

**Sample:** The total population of three hundred and forty four (344) nurses and doctors in NOHE was used for the study.

**Sampling procedure:** Purposive sampling procedure was used for this study, as it allowed the researcher to choose specific people within the population. For the purpose of this study, only 273 nurses and doctors who met the inclusion criteria were used.

### Inclusion criteria

- Doctors and Nurses who were employees of National Orthopaedic hospital, Enugu, and directly involved in the prescription and administration of antibiotics.
- Doctors and Nurses who were willing to participate in the study.
- Doctors and Nurses who were available at the time of data collection (not on leave or any academic posting outside the hospital).

**Instrument for data collection:** The instrument for data collection was self-developed questionnaire with closed ended questions organized in four point Likert type response scales of Strongly Agree (4), Agree (3), Disagree (2) and Strongly Disagree (1). The questions were developed based on the objectives of the study. The thirty five (35) items were grouped into section A to D. Section A contains seven (7) items on socio-demographic data of the respondents; section B contains nine (9) questions on the patient-related barriers; section C contains twelve (12) questions on professional healthcare providers'-related barriers and section D contains seven (7) questions on health system-related barriers to effective administration of antibiotics as prescribed to inpatients in NOHE.

The instrument was constructed using information from antimicrobial stewardship (MacDougall and Polk, 2005), problems associated with antibiotics use (WHO, 2011) and antibiotics policy (WHO, 2014).

**Reliability of the instrument:** The instrument was pilot-tested on 34 respondents selected randomly from a tertiary health institution in Enugu municipal (Enugu State University of Science and Technology (ESUT) Teaching Hospital). Test re-test was done within a period of two weeks interval. The data collected from the two administrations were used to compute the reliability coefficient using Pearson's product moment correlation coefficient which yielded a coefficient of 0.82. This was deemed adequate and the instrument considered reliable.

**Procedure for data collection:** We got permission from the Ethical Committee, National Orthopaedic Hospital, Enugu to use their health institution for the study. With the knowledge of the objectives of the study, the ethical consideration involved in the study, questionnaire items and confidentiality, we visited the wards and units daily to recruit respondents and administer questionnaires. The questionnaires were collected on the spot to ensure high retrieval rate and data collection lasted for four weeks.

**Method of data analysis:** Quantitative data collected were analysed using descriptive statistics of means, standard deviation, frequency and percentages and presented in tables. Items which were constructed in 4 point Likert type response scale of strongly agree (4), agree (3), disagree (2) and strongly disagree (1) had scale mean score of 2.5, therefore any item with a mean score  $\geq 2.5$  was considered positive response and a barrier (agrees with the statement) and any mean score  $< 2.5$  is considered negative response and not a barrier. Data collected were analyzed with the aid of statistical package for Social Science (SPSS) version 20. T-test was used and a  $p < 0.05$  was considered statistically significant.

## RESULTS

Two hundred and seventy three questionnaires were administered and all retrieved for data analysis (100% retrieval rate).

**Characteristics of the respondents:** Items 1-7 of the questionnaire elicited the characteristics of the study respondents. The responses to these items were analysed and presented on Table 1. The respondents were between 25 and 59 years of age with a mean age of  $(38.9 \pm 7.6)$  and they were mostly females (69.6%). There were more nurses (81.3%) than doctors (18.7%) and most of the doctors were resident doctors (Registrars and Senior Registrars). The study showed that 50.9% of the total respondents were nurses in the junior cadre (Nursing officers I, II and Senior Nursing officers) and about 30.4% were in the senior cadre (Principal nursing officers, Chief nursing officers, Assistant director of nursing and Deputy director of nursing). Majority of the respondents (70.0%) had more than 5 years of working experience in NOHE (29.3+26.7).

**Objective one:** To determine patient-related barriers to effective administration of prescribed antibiotics to inpatients in NOHE.

**Table 1. Socio demographic characteristics of the respondents n=273**

Socio demographic variables			Frequency	
Age category			Doctors	Nurses
			Total	Percent
25-29	3	13		5.9
30-34	13	56	16	25.3
35-39	20	65	69	31.1
40-44	10	29	85	14.3
45 and above	5	59	39	23.4
Total	51	222	64	100
Mean			273	
SD			38.9	
Years of Experience			7.6	
Experience			Doctors	Nurses
<1 years	2	4	Total	2.2
1-5 years	19	95	6	41.8
6-10 years	22	58	114	29.3
>10 years	8	65	80	26.7
Total	51	222	73	100
Sex	Doctors	Nurses	273	
Female	4	186		69.6
Male	47	36	Total	30.4
Total	51	222	190	100
Doctors professional status				
Junior cadre	44		83	
Senior cadre	7		273	16.1
Total	51			2.6
				18.7
Nurses professional status				
Junior		139		50.9
Senior		83		30.4
Total		222		81.3

**Table 2. Respondents' perceived patient related barriers to effective administration of prescribed antibiotics to inpatients in NOHE n=273**

S/N	Items	Strongly Disagree 1	Disagree 2	Agree 3	Strongly agree 4	Mean	SD
8	Patients sometimes refuse to take their antibiotics as prescribed due to fear of side effects	163(163)	54(108)	44(132)	12(48)	1.7	0.9
9	Patients sometimes refuse their antibiotics due to fear of pain.	124(124)	105(210)	34(102)	10(40)	1.7	0.8
10	Patients sometimes refuse their antibiotics due to route of transmission	82(82)	110(220)	70(210)	44(176)	2.0	0.8
11	Patients sometimes refuse their antibiotics due to lack of understanding of their disease condition and treatment pattern			153(459)	38(152)	2.7	0.8
12	Inpatients with poor financial status do not receive their antibiotics as prescribed	32(32)	50(100)			3.4	0.8
13	Patients who did not subscribe to National Health Insurance Scheme do not have their antibiotics readily available for administration	13(13)	14(28)	108(324)	138(552)		0.8
14	Patients who use out of pocket payment method sometimes may not provide their prescribed antibiotics	15(15)	77(154)	144(432)	37(148)	2.7	0.8
15	The due time for the administration may not be convenient for the patient	6(2.2)	41(82)	117(351)	109(436)	3.2	0.8
		52(19.0)	99(198)	106(318)	16(64)	2.3	

To achieve this objective, items 8-15 in the questionnaire were analyzed and the result presented in Table 2. The results showed that respondents mean score for four of the items were above 2.5; as a result we concluded that those four items were patient related barriers to administration of antibiotics as prescribed to inpatients in NOHE. Therefore the perceived patients' related barriers were: Patients sometimes refuse their antibiotics due to lack of understanding of their disease condition and treatment pattern (2.7), others were cost related factors and payment mode (poor financial status makes inpatients not to receive antibiotics as prescribed (3.4), Patients who did not subscribe to National Health Insurance Scheme do not have their antibiotics readily available for administration (2.7) and Patients who use out of pocket payment method sometimes may not provide their prescribed antibiotics (3.2).

**Objective two:** To identify healthcare providers' related barriers to effective administration of prescribed antibiotics to inpatients in NOHE.

The researcher analyzed items 16-27 to achieve objective two and results are presented in Table 3. The results in Table 3 show the mean and standard deviation of each of the twelve (12) items on Healthcare providers' barriers to administration of prescribed antibiotics to inpatients in NOHE. Eleven (11) of the twelve (12) items were identified as healthcare providers' related barriers to effective administration of prescribed antibiotics to inpatients in NOHE as their mean scores were  $\geq 2.5$ . The identified professional healthcare providers' barriers include; Failure to explain the benefits and adverse effects of the antibiotics to the patients (2.5), the financial status of the patients is not considered during prescription (2.8), Poor

**Table 1. Socio demographic characteristics of the respondents n=273**

Socio demographic Frequency variables			Total	Percent
Age category	Doctors	Nurses		
25-29	3	13		5.9
30-34	13	56	16	25.3
35-39	20	65	69	31.1
40-44	10	29	85	14.3
45 and above	5	59	39	23.4
Total	51	222	64	100
Mean			273	
SD			38.9	
Years of			7.6	
Experience	Doctors	Nurses		
<1 years	2	4	Total	2.2
1-5 years	19	95	6	41.8
6-10 years	22	58	114	29.3
>10 years	8	65	80	26.7
Total	51	222	73	100
Sex	Doctors	Nurses		
Female	4	186		69.6
Male	47	36	Total	30.4
Total	51	222	190	100
Doctors professional status			83	
Junior cadre	44		273	16.1
Senior cadre	7			2.6
Total	51			18.7
Nurses professional status				
Junior		139		50.9
Senior		83		30.4
Total		222		81.3

**Table 2. Respondents' perceived patient related barriers to effective administration of prescribed antibiotics to inpatients in NOHE n=273**

S/N	Items	Strongly Disagree 1	Disagree 2	Agree 3	Strongly agree 4	Mean	SD
8	Patients sometimes refuse to take their antibiotics as prescribed due to fear of side effects	163(163)	54(108)	44(132)	12(48)	1.7	0.9
9	Patients sometimes refuse their antibiotics due to fear of pain.	124(124)	105(210)	34(102)	10(40)	1.7	0.8
10	Patients sometimes refuse their antibiotics due to route of transmission						
11	Patients sometimes refuse their antibiotics due to lack of understanding of their disease condition and treatment pattern	82(82)	110(220)	70(210)	44(176)	2.0	0.8
12	Inpatients with poor financial status do not receive their antibiotics as prescribed	32(32)	50(100)	153(459)	38(152)	2.7	0.8
13	Patients who did not subscribe to National Health Insurance Scheme do not have their antibiotics readily available for administration	13(13)	14(28)	108(324)	138(552)	3.4	0.8
14	Patients who use out of pocket payment method sometimes may not provide their prescribed antibiotics	15(15)	77(154)	144(432)	37(148)	2.7	0.8
15	The due time for the administration may not be convenient for the patient	6(2.2)	41(82)	117(351)	109(436)	3.2	0.8
		52(19.0)	99(198)	106(318)	16(64)	2.3	

**Table 5. Relationship between the professional status of the healthcare providers and their perceived barriers to effective administration of prescribed antibiotics to inpatients in NOHE**

Professional Barriers	status	n	Mean	Std. Deviation	t	df	P-value	Decision
Patient Barriers	Doctors	51	2.6225	.41570	.713	271	.476	NS
	Nurses	222	2.5726	.45840				
Healthcare providers Barriers	Doctors	51	2.6797	.30794	-.148	271	.882	NS
	Nurses	222	2.6892	.42998				
Health System Barriers	Doctors	51	2.7353	.57366	-1.38	271	.169	NS
	Nurses	222	2.8536	.54760				

NS= Not significant

communication, Increased workload, poor timing of administration of and Disagreement between nurses and doctors on who should administer antibiotics of intravenous route (2.5).

**Objective three:** To identify perceived health-system related barriers to effective administration of prescribed antibiotics to inpatients in NOHE. To achieve objective three, Items 28-34 were analysed and the results are presented on Table 4.

**Table 6. Relationship between the gender of the healthcare providers and their perceived barriers to effective administration of prescribed antibiotics to inpatients in NOHE**

Barriers	Gender	n	Mean	Std. Deviation	t	df	P-value	Decision
Patient Barriers	Female	190	2.5500	.44836	-1.78	271	.076	NS
	Male	83	2.6551	.44925				
Healthcare providers Barriers	Female	190	2.6732	.41218	-.865	271	.388	NS
	Male	83	2.7199	.40378				
Health System Barriers	Female	190	2.8158	.56212	-.709	271	.479	NS
	Male	83	2.8675	.53455				

NS= Not significant

**Table 7. Relationship between the years of service of the healthcare providers and their perceived barriers to effective administration of prescribed antibiotics to inpatients in NOHE**

Barriers	Years of Experience	N	Mean	Std. Deviation	t	df	P-value	Decision
Patient Barriers	5 years and below	120	2.5677	.43177	-.462	271	.644	NS
	Above 5 years	153	2.5931	.46562				
Healthcare providers Barriers	5 years and below	120	2.6556	.39160	-1.139	271	.256	NS
	Above 5 years	153	2.7124	.42254				
Health System Barriers	5 years and below	120	2.9000	.52278	1.819	271	.070	NS
	Above 5 years	153	2.7778	.57226				

The results in Table 4 show the mean and standard deviation of each of the twelve (7) items on Health system related barriers to administration of prescribed antibiotics to inpatients in NOHE. The results show that all the seven (7) health system related items were identified as barriers to effective administration of the antibiotics. They all had mean scores ranging from 2.7 to 3.2. The following eleven (7) factors are health system barriers to effective administration of prescribed antibiotics to inpatients in NOHE; Antibiotics administration in NOHE is guided by policy (2.7), Prescribed antibiotics are not regularly supplied in the Hospital pharmacy for easy access (2.7), NOHE does not have a multidisciplinary team that sees to proper antibiotics use (antimicrobial stewardship) (3.2), Lack of in-service educational programme to improve health care providers antibiotics use (2.8), The system does not support doctors and nurses through the provision of necessary equipment that makes antibiotics administration easy (2.7). The system does not support doctors and nurses through proper staffing (2.8) and Rigid policies on the use of different routes by different providers (2.8).

Table 5 shows the relationship between the professional status of the healthcare providers and their perceived barriers to effective administration of prescribed antibiotics to inpatients in NOHE. This revealed no significant relationship between the professional status of the healthcare providers and their perceived barriers to effective administration of prescribed antibiotics to inpatients in NOHE. This assertion was made because the calculated test statistics (.476, .882 and .169) for the three categories are greater than the critical value of alpha ( $p > 0.05$ ). Table 6 shows the relationship between the gender of the healthcare providers and their perceived barriers to effective administration of prescribed antibiotics to inpatients in NOHE. This revealed no significant relationship between the gender of the healthcare providers and their perceived barriers to effective administration of prescribed antibiotics to inpatients in NOHE. This assertion was made because the calculated test statistics (.076, .388 and .479) for the three categories are greater than the critical value of alpha ( $p > 0.05$ ). Table 7 shows the relationship between the years of experience of the healthcare providers and their perceived barriers to effective administration of prescribed antibiotics to inpatients in NOHE. This revealed no significant relationship between the years of experience of the healthcare providers and their

perceived barriers to effective administration of prescribed antibiotics to inpatients in NOHE. This decision was made because the calculated test statistics (.644, .256 and .070) for the three categories are greater than the critical value of alpha ( $p > 0.05$ ).

## DISCUSSION

**Respondents' characteristics:** The respondents were between 25 and 59 years old and were mostly females (69.6%). There were more nurses than doctors among the respondents and more of the nurses were in the junior cadre. Majority of the respondents (70.0%) had more than 5 years of working experience in NOHE. The socio-demographic characteristics (professional status, gender and years of service) of the respondents did not affect their perceived barriers to effective antibiotics administration as seen in the result of the tested hypotheses which showed no significant relationship ( $p > 0.05$ ).

### Patients' related factors

Three of the four identified patient related barriers were finance related. Each reinforced the other. Those with poor financial status ( $\bar{x}=3.4$ ) and those using out-of-pocket payment mode ( $\bar{x}=3.2$ ) were constrained financially to provide their prescribed antibiotics whereas those using National Health Insurance Scheme (NHIS) were not constrained ( $\bar{x}=2.7$ ). This supports the goal of NHIS and promotes its use for the greater majority of the Nigerian population. Greater percentage of the respondents also agreed to the statement that patients sometimes refuse their antibiotics due to lack of understanding of their disease condition and treatment pattern (2.7). This is in line with a study carried out by Abu-Saeed *et al.* (2013) which showed that poor understanding of the disease condition and treatment pattern leads to non-compliance, misuse and abuse of antibiotics which have contributed to the high rate of antibiotics resistance (Abu-Saeed *et al.*, 2013). The finding of this study is also similar with Kehinde and Ogunnowo, 2013 on the pattern of antibiotics use in an urban slum. The study showed that the magnitude of non-adherence to antibiotics therapy as prescribed due to lack of understanding of the disease condition and treatment pattern was 86.9% being community based study which is higher than the result of the present study (70.0%) (Kehinde and Ogunnowo, 2013).

**Healthcare providers' related barriers:** The result of the study showed that antibiotics are being administered to inpatients in NOHE by only doctors and nurses and the commonly used routes of administration of antibiotics in NOHE are intravenous, intramuscular and oral. The study also showed that eleven of the twelve items in objective two were identified as healthcare providers' related barriers to effective administration of prescribed antibiotics to inpatients in NOHE with mean scores  $\geq 2.5$ . They are as follows: Not considering the financial status of the patients during prescription which was one of the professional healthcare providers' barriers (2.8) is in line with the statement of Shehab and Patel (2008) that inappropriate use of antibiotics which could be as a result of the inability of the prescriber to consider the financial status of the patient has contributed directly to increased antibiotics resistance, increased adverse drug reactions, prolonged hospitalization with increased cost of care. The result of the study also showed that increased workload was a barrier to the administration of antibiotics as prescribed to inpatients in NOHE. This is in agreement with the findings of Barlow *et al.* (2007), which identified work intensity on the doctors as a barrier to the administration of antibiotics in community acquired pneumonia. Similar barrier was also identified in the present study; that due to increased workload on the doctors in NOHE, antibiotics especially those of intravenous route (as they are to be administered by the doctors according to the hospital policy) were not administered as prescribed. The result of the study also showed that three of the eleven identified healthcare providers' barrier to administration of antibiotics as prescribed in NOHE which are; the time of administration of antibiotics is sometimes forgotten by the doctors (2.8), the health care provider may be too busy the time the administration of the antibiotics is due (3.0), the healthcare provider may decide to give the antibiotics with other medications (2.8) all centered on poor timing. The above perceived professional healthcare providers' barriers are in line with the findings of Jaroen *et al.* (2007) which identified poor timing as one of the barriers to optimal antibiotics use for community acquired pneumonia in hospitals as the healthcare workers may be busy attending to other issues when the antibiotics administration is due (Schouten *et al.*, 2007).

**Health system related barriers:** The health system barriers of antibiotics administration in NOHE being guided by policy (2.7) and NOHE's rigid policies on the use of different routes by different providers (2.8) are in line with the opinion of Malani *et al.* (2013) that developing and implementing an antibiotics policy and standard treatment guidelines (STG) will reduce the percentage of antibiotics resistant organisms in a facility, reduce the occurrence of *C. difficile* infections, improve patient outcomes and decrease toxicity. The issue in NOHE as observed is the existence of policy wherein lies a lot of bottle necks which may not have encouraged good patient healthcare outcome; antibiotics of intravenous route are sometimes not properly administered because the doctor maybe too busy or not available as at the time of administration, and the nurse cannot administer the antibiotics because the intravenous route of administration is strictly used by doctors thereby encouraging antibiotics resistance. The health system barriers of; prescribed antibiotics are not regularly supplied in the Hospital pharmacy for easy access (2.7), NOHE does not have a multidisciplinary team that sees to proper antibiotics use (antimicrobial stewardship) (3.2), Lack of in-service educational programme to improve health care providers antibiotics use (2.8), The system does not

support doctors and nurses through the provision of necessary equipment that makes antibiotics administration easy (2.7), and the system does not support doctors and nurses through proper staffing (2.8) all centered on the guidelines stipulated by Shehab and Patel (2008) for proper antibiotics stewardship in hospitals which must be overcome for proper implementation of antibiotics stewardship to be achieved. The aim of antibiotics stewardship is to optimize antibiotics use. For antibiotics stewardship to be achieved, there must be; a developed policy which must be implemented, proper antibiotics administration (right dose, right time, right route, right patient and right antibiotics), monitoring and feedback on antibiotics resistance, improved educational and administrative means, proper staffing, adequate funding and provision of required equipment (Shehab and Patel, 2008). Pollack and Srinivasan, (2014), stated that for a hospital antibiotic stewardship to be achieved there should be adequate 'tracking' ie monitoring antibiotics prescribing pattern. The results of the study showed that the hospital system did not meet the required guideline for proper antibiotics administration (antibiotics stewardship) as stipulated by Shehab and Patel (2008).

## Conclusion

Although respondents were able to identify some patients' related factors, the findings of the study showed that most of the barriers were related to healthcare provider and health system. Patients should be educated on the importance of avoiding the patient related barriers, the healthcare providers should ensure proper antibiotics administration and the healthcare system should endeavour to monitor antibiotics administration, amend any policy that jeopardizes administration of antibiotics and imbibe antibiotics stewardship as to reduce the burden of antibiotics resistance and for a better patient outcome.

**Acknowledgment:** We acknowledge National Orthopaedic Hospital, Enugu for the permission to carry out the study in the institution and our different families.

## REFERENCES

- Barlow, G., Nathwani, D., Myers, E., Sullivan, F., Stevens, N., Duffy, R. and Davey, P., 2007. Identifying barriers to the rapid administration of appropriate antibiotics in community-acquired pneumonia. *Journal of antimicrobial chemotherapy*, 61(2), pp.442-451.
- Ibrahim, O.M. and Saber-Ayad, M.A.H.A., 2012. Antibiotic misuse in different hospital wards (a pilot study in an Egyptian hospital). *Asian J Pharm Clin Res*, 5(2), pp.95-7.
- Jackson, S.L., 2015. *Research methods and statistics: A critical thinking approach*. Cengage Learning.
- John, A. and Obi, P.A., 2014. Rational Use of Medicines in Nigeria: A Critical Review. *Journal of Biology, Agriculture and Healthcare*, 4:16.
- Kamaldeen, A.S., Gbenga, S.J. and Folake, L.J., 2013. Prescription Pattern of Antibiotics among Physicians in a Secondary Health Facility in Abuja, Nigeria.
- Kardas, P., Devine, S., Golembesky, A. and Roberts, C., 2005. A systematic review and meta-analysis of misuse of antibiotic therapies in the community. *International journal of antimicrobial agents*, 26(2), pp.106-113.

- Kehinde, O.O. and Ogunnowo, B.E., 2013. The pattern of antibiotic use in an urban slum in Lagos State, Nigeria. *West African Journal of Pharmacy*, 24(1).
- MacDougall, C. and Polk, R.E., 2005. Antimicrobial stewardship programs in health care systems. *Clinical microbiology reviews*, 18(4), pp.638-656.
- Malani, A.N., Richards, P.G., Kapila, S., Otto, M.H., Czerwinski, J. and Singal, B., 2013. Clinical and economic outcomes from a community hospital's antimicrobial stewardship program. *American journal of infection control*, 41(2), pp.145-148.
- Okonko, I.O., Soley, F.A., Amusan, T.A., Ogun, A.A., Ogunnusi, T.A., Ejembi, J., Egun, O.C. and Onajobi, B.I., 2009. Incidence of multi-drug resistance (MDR) organisms in Abeokuta, Southwestern Nigeria. *Global journal of pharmacology*, 3(2), pp.69-80.
- Pollack, L.A. and Srinivasan, A., 2014. Core elements of hospital antibiotic stewardship programs from the Centers for Disease Control and Prevention. *Clinical Infectious Diseases*, 59(suppl\_3), pp.S97-S100.
- Ronald, K., Woods, E. and Patchen, D. 2015. Antibiotics use. University of Washington Medical Center, Seattle, Washington. *American family physician*, 57(11):2731-2740.
- Schouten, J.A., Hulscher, M.E., Natsch, S., Kullberg, B.J., van der Meer, J.W. and Grol, R.P., 2007. Barriers to optimal antibiotic use for community-acquired pneumonia at hospitals: a qualitative study. *Quality and Safety in Health Care*, 16(2), pp.143-149.
- Shehab, N., Patel, P.R., Srinivasan, A. and Budnitz, D.S., 2008. Emergency department visits for antibiotic-associated adverse events. *Clinical Infectious Diseases*, 47(6), pp.735-743.
- World Health Organization, 2011. *Step-by-step approach for development and implementation of hospital antibiotic policy and standard treatment guidelines*. World Health Organization.
- World Health Organization, 2014. *Antimicrobial resistance: global report on surveillance*. World Health Organization.

\*\*\*\*\*