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Perceptions and Practices of Antimicrobial Stewardship among Community Pharmacists in Abuja, Nigeria

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Abstract

Background: Irrational use of antibiotics is one of the key modifiable risk factors for antimicrobial resistance. Owing to the widespread use of antibiotics in community settings, Community Pharmacists have crucial roles in ensuring the rightful use of antibiotics.

Objective: To assess the practice and perception of Antimicrobial Stewardship (AMS) among Community Pharmacists in Abuja, Nigeria. Method: A descriptive, cross-sectional study was conducted from July to September 2020, using a self-administered validated and pretested questionnaire, in the city of FCT. The data from the questionnaire were analyzed using Statistical package for social science (SPSS) version 21 and presented as frequency and percentage of response.

Result: One hundred and sixty-four (164) Community Pharmacists participated in the study, of which, 98 were males (59.8%) and 66 (40.2%) were females. The majority (70.1%) of the Pharmacists were familiar with the vital role of the AMS program and its importance in enhancing patient care, thus indicating good perception and knowledge about antimicrobial stewardship. Many (62.2%) of the Community Pharmacists strongly agreed that they educate patients on the use of antimicrobials and resistance-related issues. The Community Pharmacists in FCT had good AMs practices.

Conclusion: The Community Pharmacists in Abuja have a positive perception and practice about Antimicrobial Stewardship. They often or always dispensed antimicrobials with prescription and complete clinical information and never dispensed antimicrobials longer than the prescribed duration. There is a need to increase the level of communication and interaction between Community Pharmacists and other health care providers.

Keywords: Perceptions; Practices; Antimicrobial Stewardship; antibiotic resistance; Community Pharmacists; Abuja

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Introduction

The increasing reports of multi-drug resistant bacteria have increased treatment failures and mortality from infections that are ordinarily treatable. Several determinates are responsible for the rising antimicrobial resistance. Misuse use of antimicrobials is one of the key risk factors [1, 2]. Research has highlighted the link between antibiotic use and its resistance [3]. Antimicrobial resistance is huge burden on the healthcare system because it increases the morbidity and mortality rates as well as length of hospital stay [4, 5]. Antimicrobial stewardship (AMS) is an approach aimed at improving, and maintaining the rightful use of antimicrobial agents for the prevention or treatment of infections [6, 7]. Antimicrobial stewardship is targeted at improving patient care and reducing health care costs of treating infections. This is achieved via coordinated interventions on the choice, dose,

dose regimen, side effects, drug interactions as well as allergies of prescribed antimicrobial agents [8].

Method

Study Design

A descriptive, cross-sectional study was conducted for a period of 2 months from July to September 2020, using a self-administered validated and pretested questionnaire, in the city of FCT. It is sit of power and a very prosperous city in Nigeria, with a population of about 3.3 million people. All the Community Pharmacists in the city were considered for inclusion. Patent medicine dealers were not recruited for the study.

Data Collection

A snowball sampling technique was used to identify all the community pharmacies in the city through their signboards on buildings or in the streets housing the premises. The questionnaire was self-administered. Participants were given the option to either complete the questionnaire on the spot or to drop the answered questionnaire to be picked up on a later date. A cover letter indicated that participation is voluntary and submission of response was taken as consent to partake in the research survey.

Sample size determination

This was derived using Yamaru (1973) formula for determining the sample size of finite population: $n = N/(1 \mid Ne\text{^}2)n$

Where n= minimum sample size

e= maximum acceptable margin of error (95% confidence level=0.05)

N= no's of community pharmacies in Abuja was 278.

1= theoretical constant.

Thus the determined sample size was 164

Instrument Development

The questionnaire was developed in the English language after the review of the previously published works of literature. Face and content validations were performed to ensure that the questionnaire is comprehensible and relevant to the local setting. The questionnaire was revised based on the recommendations of the reviewers. The questionnaire consists of two sections and 21 items including the demographic section, the second section had items that assessed and perceived importance of AMS, barriers and motivations of community pharmacists to participate in AMS and also the practices of AMS among Community Pharmacists Perception was assessed using a 5-point Likert scale and was scored using 5 and 1 point for strongly agree and strongly disagree, never to always respectively.

Area of Study

The study was conducted in FCT, Abuja Nigeria. FCT-Abuja is the capital city of Nigeria. It is within the North Central region of the country. (**Figure 1**) Abuja has a landmass of approximately 7,315 km^2.

Population of Study

The population is made up of registered Community Pharmacists

Figure 1 Map of Abuja.

in FCT, Abuja. For a premise to be called a Community Pharmacy Pharmacist(s) must be in direct control of the activities in the Pharmacy premise and the premise must be currently registered and licensed by the Pharmacists' Council. In Urban areas, chain pharmacies have been developed and most of these Pharmacies have more than one Pharmacists and it is observed that they run shifts.

Inclusion Criteria

All the registered community pharmacists in the city were considered for inclusion, except those who declined to participate, and patent medicine vendors were excluded from the study.

Exclusion Critera

Those who declined to participate and patent medicine vendors were excluded from the study.

Implication of Study

An improved understanding of routine practices and perceptions of community pharmacists related to antimicrobial stewardship can assist in the development and implementation of antimicrobial stewardship-related initiatives in community settings. Knowledge surrounding current practices and perceptions of community pharmacists regarding antimicrobial stewardship is limited. Future research into the barriers to and facilitators of community pharmacists optimizing antimicrobial use is required.

Data Analysis

The data from the questionnaire was entered into Microsoft excel and analyzed using Statistical Package for Social Science (SPSS) version 21. The analyzed data were presented as frequency and percentage of the responses knowledge of the community pharmacists about antibiotics, as well as their perceptions and practices regarding AMS between sexes and education level. Independent-sample Kruskal–Wallis tests were used to check differences among age groups and experience of the community pharmacists about knowledge about antibiotics as well as their perceptions and practices regarding AMS.

Result

A total of 184 questionnaires were distributed. The results for the demographic data are presented in (**Table 1**). A total of 98 males and 66 females participated in this study. Most of the study participants were within the age range 20-30years. They were usually the ones involved in the direct counseling and dispensing of drugs to patients (57.3%) while the age group with the least number of participants was between (41-50 years)(n=2, 1.2%). About 77.4% of the participants were Bachelor of Pharmacy holders, while a few (6.7%) were Pharm D holders. More so, more than half of the participants had served as Pharmacist for 1-4 years (n=87, 53 %).

(**Table 2**) above describes the knowledge of Community Pharmacists about Antimicrobial stewardship. As seen in the

Table 1. Socio-Demographics of the Participants.

DEMOGRAPHI DA TA	FREQUENCY	PERCENTAGE (%)
Sex		
Male	98	59.8
Female	66	40.2
Age		
20-30	94	57.3
31-40	59	36
41-50	2	1.2
51-60	9	5.5
Educational Level		
Bachelor's Degree of Pharmacy	127	77.4
Master's Degree in Pharmacy	24	14.6
Doctors Degree in Pharmacy	11	6.7
Number of Service years		
<1 year	15	9.1
1-4 years	87	53
5-9	44	26.8
>10	18	11

Table 2. Knowledge of Participants towards Antimicrobial Stewardship.

Statement	1	2	3	4	5	RI	Rank	p-Value
Antimicrobial stewardship should be incorporated at the community Pharmacy Level	0	0	0	62(37.8%)	102 (62.2)	0.924	3	0.407
AMS Programs improve patient care	0	0	0	49(29.9%)	115(70.1%)	0.94	1	0.078
AMS programs reduce problem of antimicrobial resistance	0	0	2(1.2%)	56(34.1%)	106(64.6%)	0.927	2	0.84
Adequate training should be provided to Community Pharmacists on antimicrobial use	0	4(2.4%)	7(4.3%)	55(33.5%)	98(59.8%)	0.901	5	0.193
Relevant conferences, workshops and other educational activity are required to be attended by a pharmacist to enhance understanding of antimicrobial stewardship	0	3(1.8%)	24(14.6%)	63(38.4%)	74(45.1%)	0.854	6	0.36
Individual efforts at antimicrobial stewardship has minimal impact antimicrobial resistance problem	19(11.6%)	73(44.5%)	30(18.3%)	30(18.3%)	12(7.3%)	0.83	7	0.77
I think that the prescribing physicians are the only professionals who need to understand antimicrobial stewardship	73(44.5%)	76(46.3%)	3(1.8%)	7(4.3%)	5(3.0%)	0.35	8	0.436
Pharmacists have a responsibility to take prominent role in antimicrobial stewardship and infection control programs in the health system	0	0	0	69(42.1%)	95(57.9%)	0.916	4	0.438

Table 2, approximately 70.1% of pharmacists strongly agreed that the AMS program will help to increasing the quality of patient care and ~64.6 % believed that AMS program will minimize the incidence of antimicrobial resistance. To achieve a better understanding and improve the practice of Pharmacists, most respondents believed that pharmacists should partake in conferences, seminars, and workshops on AMS program (38.4% of respondents agreed and ~45.1% strongly agreed). Likewise, approximately half of the participants (50.7%) were aware of the incorporation of Community Pharmacists in this program and 59.8% desired to receive updated training on antimicrobial use. Majority (90.8%) of participants did not agree or strongly disagreed with the statement that prescribing physicians are the only healthcare providers who need to understand AMS program and 57.9% believed that pharmacists should play a key role in AMS program as well as infection control programs in the healthcare system.

Community Pharmacists knowledge of AMS could not be ranked due to Variation in responses, therefore, the important relative index (RII) was used. The RII(relative importance index) analysis revealed that main reoccurring statements with regard to knowledge of pharmacist knowledge toward AMS were "*AMS* Programs improve patient care" (RII = 0.940), "AMS programs reduce problem of antimicrobial resistance" (RII = 0.927), "Antimicrobial stewardship should be incorporated at community Pharmacy Level" (RII = 0.924), "Pharmacists have a responsibility to take prominent role in antimicrobial stewardship and infection control programs in health system" (RII = 0.916) and the fifth been "Adequate training should be provided to Community Pharmacists on antimicrobial use" (RII = 0.901). The least ranking was "I think that the prescribing physicians are the only professionals who need to understand antimicrobial stewardship" (RII= 0.350).

As seen in (**Table 3**) above, 44.5% of the participants occasionally dispense antimicrobial agents without a prescription (p=0.481), 42.7% dispense antimicrobials on prescription with a complete clinical information (p=0.688) while 61.6% of the participants Never dispense antimicrobial for beyond the prescribed duration (p= 0.264). interestingly, 44.5% of the participants collaborate with other health professionals for infection control and antimicrobial stewardship (p=0.293%), 42.1% always communicate with the prescriber when they are unsure about the appropriateness of an antimicrobial prescription (p=0.139) while 42.1% of the participants always sought for additional clinical information such as drug interaction, adverse drug reaction, allergy etc. before deciding to dispensing the antibiotic prescribed (p=0.981). Also, 43.9% of the participants strive to reduce the transmission of infections within the community (p=0.400).

The RI revealed five top ranking statements made by Pharmacist who participated about AMS. The first ranking was "I educate patients on the use of antimicrobials, and resistance related issues" (RII= 0.921), "I collaborate with other health professionals for infection control and antimicrobial stewardship" (RII= 0.848), "I sought additional clinical information (E.g. drug interaction, ADRs, Allergy etc.) before deciding to dispense the antibiotic

Table 3. Kruskal-Wallis test was applied, RII = relative importance index, * p-value < 0.05 was considered statistically significant. Grouping variable job sector.

STATEMENT	NEVER	RARELY	OCCASIONALLY	OFTEN	ALWAYS	RI	RANK	p-Value
I dispense antimicrobials without a prescription	4(2.4%)	26(15.9%)	73(44.5%)	48(29.3%)	13(7.9%)	0.595	8	0.481
I dispense antimicrobials on prescription with complete clinical information	0	12(7.3%)	20(12.2%)	70(42.7%)	62(37.8%)	0.793	5	0.688
I dispense antimicrobials for the duration more than prescribed by the Physician on Patient's request	101(61.6%)	49(29.9%)	7(4.3%)	7(4.3%)	0	0.429	9	0.264
I collaborate with other health professionals for infection control and antimicrobial stewardship	0	13(7.9%)	21(12.8)	57(34.3%)	73(44.5%)	0.848	2	0.293
I communicate with the prescribers if I am unsure about the appropriateness of an antibiotic prescription	0	11(6.7)	39(23.8%)	44(26.8%)	70(42.1%)	0.784	6	0.139
I sought additional clinical information (E.g. drug interaction, ADRs, allergy etc.) before deciding to dispense the antibiotic prescribed	0	2(1.2%)	29(17.7%)	64(39.0%)	69(42.1%)	0.839	3	0.981
I educate patients on the use of antimicrobials and resistant related issues	0	0	3(1.81%)	59(36.0%)	102(62.2%)	0.921	1	0.242
I make efforts to prevent or reduce the transmission of infections within the community.	0	9(5.5%)	30(18.3%)	53(32.3%)	72(43.9%)	0.807	4	0.4
I ask the patients about their knowledge of prescribed antimicrobial and its usage.	0	8(4.9%)	34(20.7%)	73(44.5%)	49(29.9%)	0.779	7	0.264

prescribed" (RII= 0.839), "I make efforts to prevent or reduce the transmission of infection within the community" (RII= 0.807), "I dispense antimicrobial on prescription with complete clinical information" (RII= 0.793).

Discussion

Infectious caused by antibiotic resistant bacteria as well as communicable diseases account for the majority of morbidities and mortalities and are thus threats to public health [5, 9]. The frequent and misuse of antibiotics coupled with the unlimited accessibility due to poor regulation have heightened the levels of antibiotic misuse and resistance [10]**.** Thus, the healthcare providers/ professionals have been charged to be the drivers of AMS in practice areas. Pharmacists have been identified to have a central role in inter-professional AMS activities as they play key role in curbing the injudicious use of antibiotics. This study highlights the perceptions and knowledge of Community Pharmacists towards AMS in community pharmacy settings in Abuja Nigeria. The result of our study revealed that 70.1% of Pharmacists strongly agreed that the AMS program will help to increase patient care and approximately 64.6 % (of our respondents) believed that such program will minimize the incidence of antimicrobial resistance. To achieve an improved / quality Pharmaceutical service delivery, most study participants believed that pharmacists should regularly attend conferences, seminars, and workshops on AMS program. Our findings are in agreement with the survey in Ethiopia by Erku (2016) and a study in Malaysia by Khan *et al.,* (2016) which reported that above 90% of pharmacists agreed on the influence of AMS on appropriate patient care. Monitoring of antibiotic dispensing by Community Pharmacists is a nice approach to containing antibiotic resistance and thus improves patient care [11].

Pharmacists are well positioned to act as basic arms for AMS programs because of their key roles of processing medication orders [12]. A large proportion of our study participants (57.9%) agreed that Pharmacists have a significant role in AMS program among healthcare providers. Our findings are in line with the other published studies [6]. In developed settings, there is a growing concern to implement AMS program at community pharmacy levels [6, 13]. However, In Nigeria we don't have established AMS program in community pharmacies.

We recorded a positive indication that Community Pharmacists know their roles in AMS programs as 62.2% of the community pharmacists agreed to educate patients/clients on the on antibiotics use and its consequent misuse as it relates to resistance. recommended that this can achieved by including Community Pharmacists (CPs) in a team whose membership are to be from the pharma industry, hospitals, government and the consumers. They opined that Stakeholders should provide recommendations for and how CPs can act as AMS proponents. This is achievable by implementing any of these strategies: Improved awareness of regional antibiotic use and resistance patterns, knowledge of current treatment guidelines, modifying the antibiotics inventory as a part of community antimicrobial stewardship [6].

Collaborations between pharmacists and other health professionals are key to strengthening the gains and objectives of AMS and are fundamental strategies to developing sustainable stewardship interventions at the community levels [14-16]. Good enough 70 (42.1%) of our respondents indicated that they communicate with the prescribers if they're unsure of the appropriateness of an antibiotic prescription while 44.5% collaborate with other health professionals for infection control and antimicrobial stewardship (**Table 3**). The lack of Prescriber-CPs communication had been reported to hinder CPs readiness to provide interventions on antibiotic prescriptions [14]. Unlike our findings, there are published reports of CPs who feel very uncomfortable with the idea of the monitoring and evaluation of antibiotic prescriptions prescribed by prescribers. They attributed the e attitude to the lack of their awareness about local antibiotic guidelines, anticipated impact on the relationship with prescribers and prescribers' belief that prescriptions monitoring is not a part of Community Pharmacists' roles [16, 17]. Remarkably, a good number of our respondents (44.5%) dispense antimicrobials without a prescription. This observation is quite disturbing considering the frequency of antibiotics uses at the community levels. The practice of dispensing antibiotics without prescriptions by Community Pharmacists promotes overuse / misuse of antibiotics and it is one of the most important drivers/ risk of developing antibiotic resistance [18, 19]. The overuse or misuse of antibiotics could be low dosing, too short duration, and /or treatment of self-limiting infections and these provide an avoidable pressure causing more antibiotic resistance [20]. This practice is usually aggravated by relative higher costs of the health care system and financial benefits to the dispenser [21, 22]. Constant exposure to low doses of antibiotics may alter the gut flora; increase the risk of infections and antibiotic resistance.

In Nigeria, there is poor regulation /control of antibiotic sales and purchases can be made at the community pharmacies without the prescription by clinician. Even though training programme on antibiotic use and resistance exist, it is mostly focused on healthcare providers in the hospital environments. This goes to support the response of our respondents that relevant conferences, workshops and other educational activities are required to be attended by pharmacists to improve their knowledge and practice of antimicrobial stewardship.

In conclusion, the Community Pharmacists in FCT have a positive perception and practice about Antimicrobial Stewardship (AMS). There is a need to increase the level of communication and interaction among members of the health care team. Periodic training should be organized on infection control and Antimicrobial Stewardship to become effective and practiced in the Community Pharmacies.

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