



A Study of Knowledge of Antibiotics and Misuse among Paediatric Caregivers Visiting Two Healthcare Facilities in Nigeria

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Article History	Abstract
Received: 06-May-2026 Accepted: 14-Jun- 2026 Published:03-Aug -2026	Antibiotic misuse is a driver for antimicrobial resistance in resource-limited settings with unrestricted access. The objective of this study is to examine the knowledge of antibiotics and the prevalence of antibiotic misuse among paediatric caregivers in two healthcare facilities in Benin City. A descriptive cross-sectional study was conducted among 262 paediatric caregivers who visited Central Hospital and University of Benin Teaching Hospital during the study period using a standardized questionnaire. Data were analyzed with SPSS version 22 using descriptive statistics. About half [144 (47.3%)] of the pediatrics caregivers had poor knowledge of antibiotics. Paediatric caregivers in rural areas had poor knowledge 32 (22.2%), compared with those in urban settings, 93 (87.8%), $p=0.01$. Antibiotic misuse was high [216 (82.8%)] across both health facilities. No socio-demographic factor was found to be associated with misuse of antibiotics. Most commonly misused antibiotics were amoxicillin [155(59%)] and metronidazole [142(54%)] used for symptoms such as fever [183(70%)] and cough [127 (45.8%)]. Antibiotic knowledge was found to be average, but misuse of antibiotics was high in both healthcare facilities. Education on appropriate use of antibiotics can start from healthcare institutions targeting paediatric caregivers, which can be upscaled towards the public.
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Introduction

Antimicrobial misuse is a major cause of antimicrobial resistance (AMR) which has become a global problem (WHO 2017). The consequences of AMR extends beyond the clinical domains including therapeutic failure, increase in cost of treatment, complications of infectious diseases and death in some cases, it has economic effects as it increases cost of treatment and channeling of resources that would have been useful in economic development too manage the menace of antimicrobial resistance (WHO 2017; Collignon 2015; Macgowan & Mcnaughton 2017).

Antimicrobial resistance is spreading more in Low and Middle Income Countries (LMICs) Africa where factors such as unrestricted access to antibiotics, irrational prescribing and lack of or poor laboratory services are widespread (Ofori-Asenso *et al.*, 2016). In a study conducted among 12 developing countries, it was reported that the highest number of average drugs per prescription (3.8 drugs/prescription) was in Nigeria, in addition, it had 48% of antibiotic prescription which was the highest (NCDC 2017; Hambal *et al.*, 2020). Paediatrics especially those under five years constitute the major users of antibiotics because they are more prone to infections and poor hand hygiene practice among this population, hence they are the target of inappropriate antibiotic use and antimicrobial resistance (Allwell-Brown *et al.*, 2011; Zewdie *et al.*, 2025). Inappropriate antibiotic use can either be overuse, underuse or misuse. Studies in some part of Nigeria reveal that paediatric caregivers misuse antibiotics by routinely using it as self-medication to treat their children when they have diarrhea, fever or upper respiratory tract infections (Uchendu *et al.*, 2009; Okide *et al.*, 2020). Caregiver's limited knowledge and use of antibiotics have also contributed to this trend in addition to unlimited access. Antibiotics are freely accessible in pharmacy shops, patent medicine shops and even hawked around in busy places and buses. One can easily get antibiotics without a prescription from these sources (Belachew *et al.*, 2021). In Nigeria, a national survey on the prevalence of antibiotic resistance in Nigeria found that enteric *Escherichia coli*, *shigella* and non-typhoidal salmonella are highly resistant to penicillins, aminoglycosides, cephalosporins and cotrimoxazole (NCDC 2017). Methicillin resistant staphylococcus aureus (MRSA) increased from 18.3% in 2007 to 42.3% in 2013 (Leopold *et al.*, 2014). More recently a study in Lagos State University Teaching Hospital reported that the pathogens studied were resistant in all paediatric age groups to the most available and empirically used antibacterial agents in Nigeria including ampicillin, amoxicillin + clavulanic acid, cefuroxime, and cefepime (Aderonke *et al.*, 2024). These results highlight the importance of implementing strategies to reduce antibiotic use and resistance. However, there is limited

data on paediatric caregiver's use of antibiotics in Edo State in Southern Nigeria. This study aims to investigate the knowledge and use of antibiotics among paediatric caregivers visiting two healthcare facilities and to compare findings from both facilities.

Methodology

Study design and Setting: this was a descriptive cross sectional study conducted in the paediatric pharmacy of two health facilities in Benin City Edo State, Nigeria. the facilities are Central hospital a secondary healthcare facility owned by the State government and University of Benin Teaching Hospital (UBTH) a tertiary health care facility owned by Federal government.

Study Population and Sampling: The study participants include caregivers of paediatrics aged 12 years and below visiting the out-patient paediatric pharmacy to fill their prescriptions in both facilities. Two hundred and sixty two participants were included in the study making 131 per facility. Systematic random sampling was adopted with every 3rd paediatric caregiver that meet the inclusion criteria were included in the study. The Study was conducted between October-November 2023.

Data Collection Tool: standardized questionnaires were used for the study adopted from similar studies that have been done (Auta *et al* 2013; Okide *et al* 2020; Hambal *et al.*, 2020). The questionnaire had 5 sections. Section one was the socio-demographics of participants, section two had 4-item questions on knowledge of what antibiotics do in a yes or no response with Yes scored as 2, and No scored as 1 given a total score of 8 (Do you think antibiotics can be used for all infections whether bacteria, fungi or viral? Do you think antibiotics should be used anytime your child/ward has cold, catarrh or sore throat? Do you think antibiotics can be used to treat all cases of diarrhea, stomach upset or indigestion? Do you think antibiotics can cause side effects during use?). Section three contains 10 questions on misuse of antibiotics on a 5-point likert scale of always, often, sometimes, rarely and never with scoring of 1-5 respectively giving a total score of 40 (How often do you ask your doctor to prescribe antibiotics for your child/ward when they are not supposed to? How often do you use warm water to mix antibiotic powder form for your child? How often do you forget to give antibiotics to your child when you're supposed to? How often do you find it difficult to measure the correct does of

antibiotics to your child/ward? How often do you use antibiotics in liquid form after 14 days? How often do you give your child antibiotics without consulting a physician or a pharmacist? How often do you use antibiotics meant for one child for another child or family member when they fall sick? How often do you stop antibiotic dosage because the child feels better? How often do you reuse antibiotics for the same child because you have used it in the past when they had similar symptoms? How often do you want to change the physician because he does not prescribe antibiotics when you want them to? Section 4 had questions on most commonly used antibiotics by care givers without prescription and section 5 was the most common symptom of ailment for which antibiotics are mostly used without a doctor's prescription. Score point of 8 was considered good knowledge while score point of between 40 to 50 was considered good practice or use of antibiotics.

Ethical Consideration: Ethical clearance was gotten from the Medical Service Department of the State's hospital management board and the Ethics and Research Committee of UBTH with approval numbers HA-737/45 and ADM/E/22/A/VOL./VII/14831011 respectively. Administrative clearance was received from the Head of Pharmacy units. Informed consent was sought from all participants and confidentiality was maintained.

Data Analysis: data were entered into SPSS version 22 and cleaned. Descriptive (frequencies and percentages) and inferential (Chi square and Fisher's exact tests) statistics were performed to determine the relationship between facilities and sociodemographic data on knowledge and use of antibiotics. P-value was set at 0.05, hence values less than that were considered statistically significant.

Results

A total of 262 caregivers participated in the study, of which majority were females [210(79.8%), more than half of them were within 25 to 34 years old [196 (74.5%)] and most of them were educated up to the secondary level [248 (94.3%)] (Table 1).

Table 2 shows that 144 (47.3%) caregivers had poor knowledge of antibiotics while 138 (52.7%) had good knowledge. A comparison of both healthcare facilities using individual facility results of knowledge shows that 42.7% of paediatric caregivers in UBTH versus 51.9% of

those in central hospital had poor knowledge, while 57.3% versus 48.1% had good knowledge. However, based on the overall knowledge results, 54.3% of caregivers in UBTH had good knowledge compared 45.7% of those in central hospital but without statistical significance. Of all the socio-demographic data used to compare knowledge of antibiotics among paediatric caregivers, only residence was found to be statistically significant. Those in rural area had poor knowledge 32 (22.2%) compared with those in urban settings 93 (87.8%), $p=0.01$.

Of the 262 participants, only 46 (17.2%) of participants had good practice of antibiotic use. Majority [216 (82.8%)] misused antibiotics with a score of less than 40. Table 3 shows the relationship between sociodemographic data and participant's use of antibiotics. None of the socio-demographic data was statistically significant in relation to appropriate use of antibiotics.

In Figure 1 below, Amoxicillin is the most commonly used antibiotics by paediatric caregivers without a prescription [155 (59%)] followed by Amoxicillin-Clavulanic acid [142 (54%)] and metronidazole [142 (54%)].

Figure 2 shows the symptoms or perceived ailment for which antibiotics were used by paediatric caregivers without a prescription. Fever was the most common symptom [183 (70%)] followed by cough [127 (45.8%)] and catarrh [105 (40%)].

Discussion

This study investigated the knowledge and use of antibiotics among paediatric caregivers in two public institutions in Benin City, Nigeria. About half of the participants in this study had good knowledge of antibiotics. Caregivers in the tertiary hospital had better knowledge than those in the secondary hospital but it was not statistically significant. In a study conducted among 321 breastfeeding mothers in Kaduna, 49.5% of them had poor knowledge of antibiotics and believed that antibiotics can be used to treat viral infections, fever and common cold (Hambal *et al.*, 2020). While in Ibadan, 85.3% of clients visiting community pharmacies did not have adequate knowledge of While in Ibadan, 85.3% of clients visiting community pharmacies did not have adequate knowledge of antibiotics (Akanke-Sholabi *et*

Table 1 Sociodemographic Data of Participants

Variable	Frequency (Percentage)
Facility	
UBTH	131 (50)
Central Hospital	131 (50)
Age Group	
18-24	37 (14.1)
25-34	115 (43.7)
35-34	80(30.8)
45-54	25 (9.5)
≥55	5(1.9)
Gender	
Male	53 (20.2)
Female	209(79.8)
Occupation	
Unemployed	100 (45.7)
Public Sector	52 (24.2)
Private sector	25 (11.5)
Retired	3 (1.4)
Education	
Uneducated	12 (4.9)
Primary	248 (94.3)
Secondary and/or Tertiary	2 (0.8)
Residence	
Rural	50 (19)
Urban	212 (81)

Table 2 Relationship between Socio-demographic Characteristics and Knowledge of Antibiotic

Variable	Poor Knowledge N (%)	Good Knowledge N (%)	p-value
Facility			0.157
UBTH	56 (38.9)	75 (54.3)	
Central Hospital	68 (61.1)	63 (45.7)	
Age (years)			0.164
18-24	20(13.9)	17(12.3)	
25-34	61 (42.3)	53 (38.4)	
35-44	30 (20.8)	14 (10.1)	
>45	13 (9.0)	17 (12.3)	
Gender			0.11
Male	20 (13.8)	33 (25.3)	
Female	104 (86.1)	105 (74.7)	
Occupation			0.126
Unemployed	20 (13.8)	18 (13.1)	
Government Sector	26 (18.1)	37 (26.8)	
Private Sector	78 (54.1)	83 (60.1)	
Education			0.187
Primary	13(9.0)	2 (1.4)	
Secondary and more	109 (91.0)	136 (98.6)	
Residence			0.01
Rural	32 (22.2)	18 (13.0)	
Urban	93 (87.8)	119 (87.0)	

Table 3 Relationship between Socio-demographic Characteristics and Antibiotic Use

Variable	Poor Practice N (%)	Good Practice N (%)	p-value
Facility			
UBTH	111 (51.4)	20 (43.5)	0.234
Central Hospital	105 (48.6)	26 (56.5)	
Age (years)			
18-24	32(14.8)	5 (10.8)	0.316
25-34	96 (44.4)	18 (39.1)	
35-44	66 (30.5)	14 (30.4)	
>45	22 (10.1)	9 (19.5)	
Gender			
Male	40 (18.5)	13 (28.3)	0.131
Female	176 (81.5)	33 (71.7)	
Occupation			
Unemployed	31 (14.3)	8 (17.4)	0.132
Government Sector	47 (21.7)	15 (32.6)	
Private Sector	138 (63.9)	23 (50)	
Education			
Primary	12 (5.5)	3 (6.5)	0.432
Secondary and more	204 (94.5)	43 (93.5)	
Residence			
Rural	42 (16.0)	8 (3.0)	0.758
Urban	174 (66.5)	38 (14.4)	

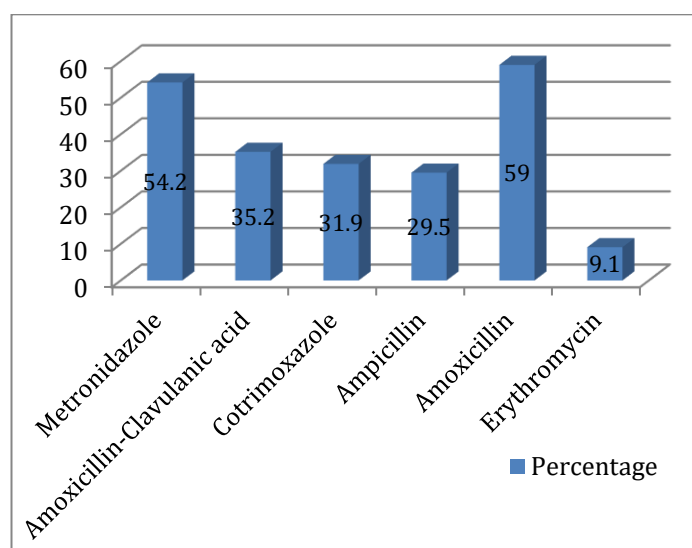


Figure 1. Antibiotics Commonly Misused

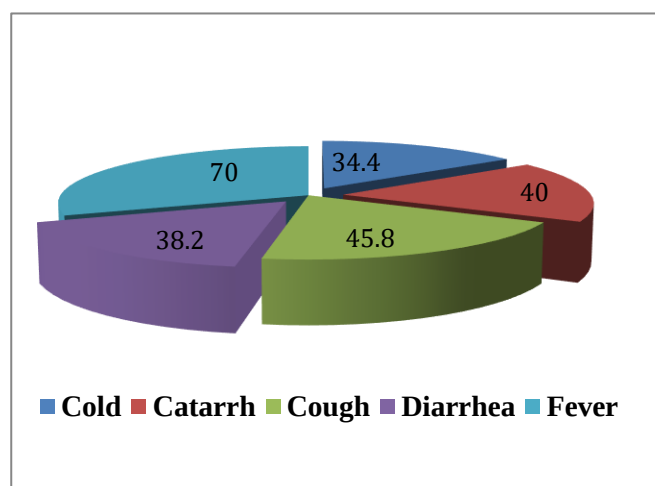


Figure 2. Symptoms for Which Antibiotics Are Misused

al., 2023). In another study among residents in Ikeja, Lagos state, Nigeria, 71.2% of the respondents had good knowledge of antibiotics (Abiola *et al.*, 2023). This is quite higher than that reported in this present study and may be due to the nature of the population involved in the study. Our study targeted paediatric caregivers who were visiting hospitals with their wards and some of them were rural dwellers unlike those in Ikeja that are all urban dwellers. In eastern Nigeria, 605 of paediatric caregivers in a finding 60% of these caregivers admitted that they thought metronidazole was an antimotility agent (Uchendu *et al.*, 2009). These results from different parts of the country reveal knowledge deficit in terms of antibiotics. Lack of adequate knowledge about antibiotics can contribute immensely to its misuse especially in climes lacking restricted antibiotic use (Belachew *et al.*, 2021). Of the socio-demographics factors, only area of residence was found to influence knowledge of antibiotics as urban dwellers had better knowledge compared to rural dwellers ($p=0.01$). In a

study conducted in Southwestern Nigeria, education was found to be associated with knowledge of antibiotics as those with no formal education had poorer knowledge than those with secondary and tertiary education (Akinlade *et al* 2015).

Regarding the practice and use of antibiotics only 17.2% used antibiotics appropriately, showing a large proportion of paediatric caregivers who misuse antibiotics. Interestingly, this study points to a similar behavior in antibiotic misuse among caregivers in both the secondary and tertiary healthcare facilities. This is noteworthy because more than 90% of participants in this study were educated up to secondary level, giving a snapshot of what may be general trend among the public. Some ways antibiotics are misused by participants includes self-medicating, administering incorrect dose, requesting for antibiotics from a physician even when not needed, using left over antibiotics and wrong reconstitution for antibiotics in suspension. Similar trend was noted in a research done in Enugu among paediatric caregivers. Most caregivers admitted that they had used antibiotics on their wards gotten without a prescription or from left over medications received from previous hospital visitation. Majority of them also asked their physician to prescribe antibiotics and 84.6% of them acknowledged that they received it (Okide *et al.*, 2020). In Bangladesh, a study on antibiotic misuse was reported to be 64% with more than half of the respondents lacking accurate knowledge of antibiotics (Islam *et al.*, 2024).

The most common reasons for misuse of antibiotic in this study were fever and cough, while amoxicillin, amoxicillin-clavulanate and metronidazole were the antibiotics most misused. This is tandem with other studies that highlight upper respiratory tract infections as the most common infection for self-treatment with antibiotics (Okide *et al.*, 2020; Wonodi *et al.*, 2024). Other studies reveal that malaria infection and diarrhea are notable childhood diseases for which self-medication with antibiotics is practiced (Uchendu *et al.*, 2009; Ekong *et al.*, 2024). Antibiotics most commonly misused as reported in other studies are Amoxicillin and Amoxicillin -clavulanate (Wonodi *et al.*, 2024), metronidazole and amoxicillin (Uchendu *et al.*, 2009; Ekong *et al.*, 2024) and amoxicillin and metronidazole by Poopola *et al.*, (2024) in their study among undergraduates students in Nigeria.

This highlights the importance of one established strategy to curb antibiotic misuse which is educating to change behavior. This form of education is beyond a onetime exposure, but entails repeated communication using different channels and methods until majority of the targeted population make notable changes in behavior (Burstein *et al.*, 2019). This education can start with paediatric caregivers in healthcare facilities and then extended to the public. The government, healthcare professionals, the media and general public have a role to play in educating and creating awareness on appropriate antibiotic use, however, it the government that has a huge responsibility in addressing antibiotic misuse by implementing the national action plan for antimicrobial resistance using the one health approach as recommended by World Health Organization (WHO 2015), and implementing other policies targeted at other drivers such as restricting sales of antibiotics, reviving primary health care centers to make them accessible thus discouraging self- medicating, equipping hospitals and laboratories to promote routine laboratory investigation before prescribing hence promoting rational prescribing.

Conclusion

This study shows that about half of the paediatric caregivers had knowledge deficit about antibiotics. Most (82.8%) paediatric caregivers misused antibiotics. Similar pattern of misuse was observed in both healthcare facilities. Those in urban setting were more knowledgeable than those in rural setting; however, no relationship was found with socio-demographic data of caregivers and the appropriate use of antibiotics.

Authors Contribution

Acknowledgements

Conflict of Interest

The authors declare no conflict of interest.

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