

Drug Prescription Pattern in a Primary Care Clinic, Southwest, Nigeria

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Abstract

Background: Rational drug use is of the utmost importance in a region such as West Africa, where the prevalence of drug resistance is increasing due to inappropriate use of medications.

Objective: This study aimed to assess the pattern of prescription drug use at the General Outpatient Clinic of the University College Hospital, Ibadan. This study also assessed the knowledge and attitude toward rational drug use among prescribing physicians in the Clinic.

Design: The study was a retrospective cross-sectional review of patients' records over three years. The medical records were selected by systematic random sampling and subjected to the WHO core drug use indicators. Prescribers at the study site had their knowledge, attitude, and practice (KAP) of rational drug use assessed with a self-administered questionnaire.

Results: A total of 795 medical records were analyzed for drug use indicators. The mean number of drugs per encounter was 2.64 ± 1.23 . The percentage of encounters in which an antibiotic was prescribed was 20.4%, while 71.6% of all drugs prescribed were in the generic form. From the KAP survey, 64% of physicians routinely prescribed both generic and brand names, and 68% admitted they needed further education on rational drug use.

Conclusion: Using the WHO core drug use indicators, this study identified some degree of polypharmacy and poor adherence to the generic prescription of drugs. Continuing Medical Education for health workers is encouraged to stem the irrational prescription of medications in the African sub-region.

Keywords: Prescription Drugs Use, Rational Use of Medicines, Physician's knowledge, Nigeria

INTRODUCTION

Irrational drug use is prevalent in Nigeria. In a global report, the World Health Organization estimated that half of all medicines are inappropriately prescribed, dispensed, or sold and that 50% of patients do not use their medicine the right way¹. Studies in high-income countries such as Canada and the USA, as well as studies in middle-income countries such as China, have shown that irrational drug use is not limited to low-income countries²⁻⁴. Governments in Low and Middle-Income Countries spend as much as half of their national health budgets on drugs and medical consumables, most of which are utilized irrationally⁵⁻⁷. The global menace of irrational drug use has negative consequences on the country's health indices⁸. This could be due to adverse drug reactions, drug resistance, contraction of injection-related diseases such as hepatitis B, and other adverse health conditions both to the individual and the nation^{8,9}.

In 1985, at a World Health Conference held in Nairobi, Africa. A definition was adopted for the concept of rational drug use, which though it has been in existence for decades, had no standard definition¹⁰. It was posited that: Rational use of drugs requires that patients receive medications appropriate to their clinical needs, in doses that meet their requirements for an adequate period and at the lowest cost to them and their community^{11,12}. This definition was further described as

the five rights, which entails prescribing the right drug at the right dosage through the right route at the right time for the right patient. Irrational drug use is defined as the absence of any of these rights¹³. The World Health Organization (WHO), in collaboration with the International Network for Rational Use of Drugs (INRUD), developed a set of core drug use indicators to evaluate the global pattern of drug use in different countries and across different health facilities¹⁴. These indicators were designed to help measure performance in prescribing practices, patient care, and facility-specific factors¹⁴. These indicators have been standardized and revised and are recommended for use in drug use indicator studies globally^{4,15-17}. These indicators aim to help describe current prescribing practices in health facilities and assist prescribers in identifying potential irrational drug use that may affect patient care^{14,18-21}. These prescribing core drug use indicators are crucial in examining the prescribing practices of healthcare providers. They include the average drugs per encounter, percentage of drugs prescribed by generic name, percentage of encounters with an antibiotic prescribed, percentage of encounters with an injection prescribed, and percentage of drugs prescribed from essential drugs list or formulary¹². Though studies have been conducted globally on the rational use of medicine using the WHO indicators, fewer studies have assessed the knowledge, attitude, and practice of rational drug use among the prescribers. The irrational use of

medication is notably worse in developing countries where weak health systems are the norm and mechanisms of routine monitoring of medicine use are "not well developed or often non-existent" ^{22,23}. Studies have also reported that the practice of irrational drug use is higher in primary healthcare facilities when compared to secondary and tertiary ones ²⁴. Teaching hospitals are well known for standard clinical practices based on evidence-based medicine. The General Outpatients Clinics are gateways to these tertiary facilities, providing primary care to all patients. Therefore, this study aimed to assess the pattern of prescription drug use and the knowledge and attitude underlying doctors' prescribing practices in the General Outpatient Clinic of the University College Hospital, Ibadan, Nigeria, using the WHO drug use indicators.

METHODS

Study Design: This was a retrospective cross-sectional study of patients' medical records over three years (January 2015 - December 2017).

Study Site: The study was carried out at the General Outpatient (GOP) Clinic of the University College Hospital, Ibadan, Nigeria. Ibadan is the capital of Oyo state, situated in the South-Western region of Nigeria, West Africa. Ibadan is a cosmopolitan city, with a population of about four million where almost all the Nigerian ethnic groups coexist but with a preponderance of Yoruba people.

The University College hospital is the first tertiary hospital in the West Africa sub-region, established in 1957. Due to the poorly funded peripheral health system, the hospital provides primary, secondary, and tertiary health services to Oyo-State and its environs. The General Outpatient Clinic is the entry point for most patients presenting to the University College Hospital, where primary health care services are provided to patients of all ages and both sexes. The health care is provided by the competent Family Physicians and supervised Family Physicians in training as first contact frontline doctors, with referral to other specialties as the need arises.

Study Population: Medical records of registered adult patients who attended the General Outpatient Clinic of the University College Hospital, Ibadan, from January 2015 to December 2017, irrespective of the reasons for encounter or presentation, were reviewed.

Sample Size Determination: According to the WHO Document on investigating drug use in health facilities, at least 600 encounters should be included in a cross-sectional survey to describe the prescribing practices ¹⁴. Therefore, the minimum sample size of 600 was fixed.

Sampling Technique: The GOP Medical Records for the period of January 2015 to December 2017 was obtained. A systematic random sampling technique was used in selecting the case notes for the research study. Each month, a suitable sampling interval was chosen to enable systematic random sampling of 20 case notes per month. This gave a total of 720 case notes over the thirty-six months' study period.

Respondents for the Knowledge, Attitude, and Practice study were obtained from the list of doctors who had been working at the Clinic for not less than three months. The list was obtained from the Head of the Department of Family Medicine, and a total sampling of doctors working at the Clinic during the period of data collection was done. Questionnaires were administered to all consenting prescribers.

Inclusion Criteria: The inclusion criteria included all registered patients with case notes seen from January 2015 to December 2017, male and female patients aged 18 years and above. For the KAP survey, consenting Resident doctors and Consultants Family Doctors who attended to patients in the

Clinic during data collection were recruited. Eligibility criteria were that the physicians should have been prescribing in the Clinic for not less than three months.

Ethical Approval: Ethical approval was sought and obtained from the ethical review committee of the University of Ibadan/University College Hospital, Ibadan, with ethical approval number: UI/EC/18/0289. Written permission was obtained from Director, Clinical Services, Research and Training of the hospital and the Head, Department of Family Medicine, UCH, Ibadan before data collection.

Data Collection: Data was collected using the WHO Prescription Data Collection Form adopted from the WHO guidelines on investigating drug use ¹². This was used to retrieve sociodemographic information, including age, medication information such as drug name, and dosage regimen. The form also recorded the number of drugs per encounter, the number of generic drugs prescribed, if antibiotics or injections were used or not, and the diagnosis.

The doctors' knowledge, attitude, and practice were assessed using a KAP Questionnaire adapted from a previous study ²⁵. It assessed the respondents' sociodemographic, professional cadres, awareness of the National Essential Drug List (EDL), and attitudes towards acquiring more knowledge on rational drug use.

Data Analysis: The data forms and questionnaires were manually sorted out to check for errors and omissions at the end of data collection on each day. The data was then entered into the computer and analyzed using Statistical Package for Social Sciences (SPSS) version 21. Results were reported using descriptive analyses.

RESULTS

A total of 795 case notes were analyzed for drug use indicators. Patients seen in the study period were between 18 and 83.0 years old (mean 37.34± 17.8). The male-to-female ratio was 1:1. A total of 2,100 drugs were prescribed from 795 prescriptions, and the mean number of drugs per prescription was 2.64 ±1.22.

Table 1: Characteristics of the 795 Case Records analysed for rational drug use in the General Outpatient Clinic, University College Hospital, Ibadan.

Age-Group (Years)	Frequency	Percentage
<18	163	20.5
18-35	126	15.8
36-59	463	58.2
>=60	43	5.4
Total	795	100
Number of drugs prescribed		
0	79	9.9
1-2	504	63.4
3-4	190	23.9
>4	22	2.8
Total	795	100
Use of Antibiotics		
No	633	79.6
Yes	162	20.4
Total	795	100

A higher proportion of the prescription was to adults aged 18 years to 60 years of age. Table 1 also shows the number of drugs per prescription in the GOP Clinic. It shows that 504 (63.4%) had two or fewer drugs per prescription, while 212 (26.7%) had more than two drugs per prescription. Only 22 (2.8%) had more than four drugs per prescription. The percentage of encounters in which an antibiotic was prescribed was 20.4%, while 71.6% of drugs prescribed were in the generic form.

The reasons for encounter (diagnosis) were categorized using the International Classification of Primary Care 2 classification for ease of reference. The most common diagnoses were malaria and hypertension, categorized under the General and unspecified disease group (25.4%)—followed by neurological with 22.9%. A chart depicting the disease profile of the patients is shown in figure 1.

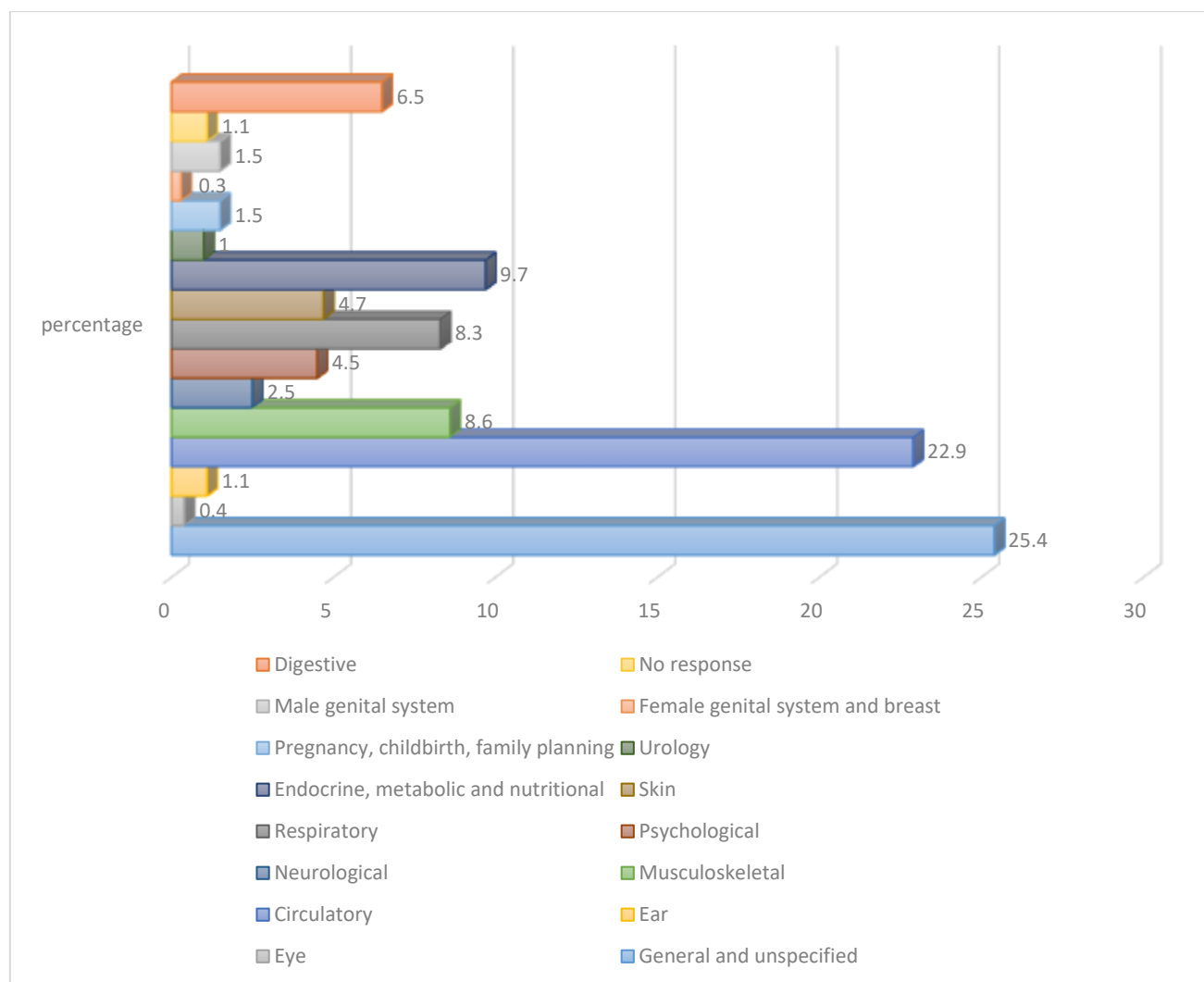


Figure 1 - Disease Profile of patients using the International Classification of Primary Care (ICPC 2)

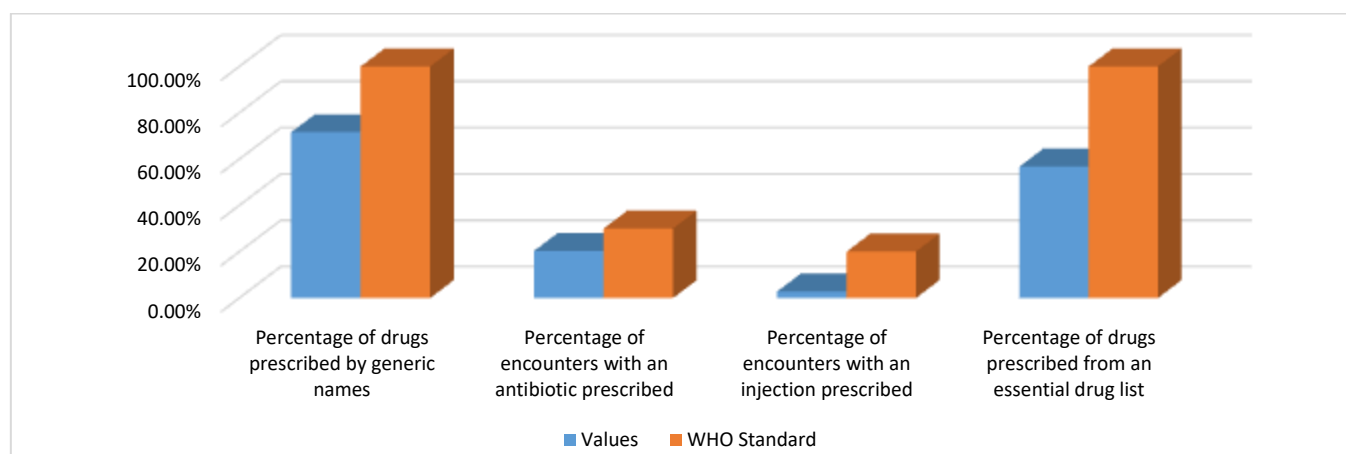
Twenty-five prescribers filled out the KAP questionnaire. All the prescribers were medical doctors in the Family Medicine Department who oversees the General Outpatient Clinic. More than half (56%) of the doctors had 10-19 years of professional practice, while 12% had more than 20 years of professional practice. About a quarter of the doctors were Consultants, 60% were Senior registrars, and 16% were Registrars.

Though 96% of the doctors were aware of the national essential drug list, only 36% possessed personal copies. Majority (64%) of the prescribers prescribed both generic and brand drugs routinely, while 68% expressed interest in further education on rational drug use. A summary of these characteristics is depicted in Table 2.

Table 2: Knowledge, attitude and practice characteristics of prescribers in the GOPD Clinic, University College Hospital, Ibadan.

Characteristics	Number (% of total)
Duration of professional practice	
-<10 years	8(32%)
-10-19 years	14(56%)
->=20 years	3(12%)
Professional status	
-Registrar	4(16%)
-Senior Registrar	15(60%)
-Consultant	6(24%)
Awareness of existence of National Essential Drug List (EDL)	
-Yes	24(96%)
-No	1(4%)
Possession of own copy of EDL	
-EDL	9(36%)
-NDF	5(20%)
-Neither	10(40%)
-Did not indicate	1(4%)
My prescriptions are mainly	
-Generic	7(28%)
-Branded	2(8%)
-Mixture of branded and generic	16(64%)
I need education on RDU	
-Yes	17(68%)
-No	4(16%)
-Did not indicate	1(4%)

Also, the prescribing practices indicators in this primary care clinic domiciled in a Nigerian Premiere teaching hospital compared to the WHO core drug indicators are illustrated in Figure 2.

**Figure 2: Bar chart comparing the prescribing practices in this tertiary health facility and the World Health Organization standard indices.**

DISCUSSION

The average number of drugs prescribed per patient was 2.64 ± 1.22 . Although this falls short of the WHO recommended standard of 2, it is lower than the observed rates in other parts of the country²⁴⁻³⁰. This corroborated the finding that polypharmacy is common in the world's most populous black nation with its attendant consequences²⁶.

The lower prescription rate observed in our study may be because the study was conducted in a tertiary teaching hospital, and the prescribers were trained doctors in postgraduate training or Consultant Family Physicians. A similar study among Primary Health Care workers in Osun State, Nigeria, reported an average of 6.11 drugs per prescription, which was three times the WHO standard³¹. Amadi and Zarei, in a study among Family Physicians in 103

Primary Health Centres, reported an average number of drugs per prescription as 3.14 (± 1.2)³².

Akande-Sholabi et al., in a study at the Geriatric Centre, UCH, Ibadan, Nigeria, reported a prescription of more than five drugs among 28.3% of the elderly population studied³³. Though polypharmacy is commoner amongst the elderly, only 5.4 % of our study population were over 60 years old.

Other African countries have been shown to fare better than Nigeria in previous studies. A similar study in Hawassa University Teaching and Referral Hospital, Ethiopia, revealed an average of 1.9 drugs per encounter within the acceptable limits of WHO recommendations³⁴. Studies in Sudan and Zimbabwe likewise reported lower means of 1.4 and 1.3, respectively³⁵. The lower means reported in these countries could be attributed to better training of the prescribers on rational drug use. However, prescribing practices in the Middle East were consistent with findings in this study, with an average of 2.9 drugs per encounter in a study done in the United Arab Emirates³⁶.

Antibiotics are a widely prescribed drug in outpatient clinics and among hospitalised patients^{30,37}. Unfortunately, misuse of these drugs leads to antibiotic resistance, which is fast becoming a public health issue^{37,38}. We observed that 20.4% of the patients reviewed were prescribed antibiotics within the study period. This is lower than values (50%-75%) reported from other studies conducted in Nigeria^{25,26,28,37}. Similarly, the percentage of prescriptions involving antibiotics was 52.1% amongst rural Family Physicians practising in Iran³². In Ghana, Bosu and Ofori-Adjei found that antibiotics are prescribed for malaria and diarrheal diseases where they are ineffective and unnecessary³⁹. A similar study in a rural district hospital, in India, also reported antibiotics prescription for 84% of patients with diarrhoea disease⁴⁰. Similarly, there were indications that prescribers seldom undertook the necessary diagnostic measures before prescribing antibiotics and may also be prescribing them needlessly^{16,22}. Unnecessary antibiotic use promotes drug resistance, increases the risk of side effects, and is wasteful of medical resources^{25,26,28,37}.

Prescription of generic analogue drugs over branded substitutes is preferred not only because they are less expensive but also equal potency^{24,39}. However, lack of proper education on these facts among some prescribers has led to the prescription of branded substitutes only, even when not indicated²³. In this study, 71.6% of the drugs prescribed were generic, lower than the WHO standard of 100%. Other studies in Nigeria have reported lower use of generics in Ilorin (46.2%) and Kano (42.7%)^{28,41}. This finding contrasts with a study in Tanzania, where 84.0% of drugs prescribed were in generic forms²². Similar results were reported in studies in Ethiopia and Iran, where 98.7% and 95.1% of medications prescribed were by their generic names^{32,34}. Also, 50% of prescriptions by Junior Residents in a tertiary hospital in India were brand names²⁰. However, a study in the United Arab Emirates (UAE) reported that only 7.35% of drugs prescribed use generic names³⁶. This high prescription of brand names in the UAE might be attributed to the fact that the survey was done in private clinics where patients are likely to be wealthy and has a penchant for brand names, and most of them can indeed afford brands. Also, the growing capitalism in the drug industry and the towering effects of renowned drug companies in marketing their brands promote prescribing certain brands.

Less than 3% of the drugs prescribed in this study were injectable. This is well below the recommended WHO standard of less than 20% injection prescription. This observation could be because our study was conducted in an outpatient clinic,

and most of the patients were discharged home after consultation. Also, most acutely ill patients needing faster routes of drug administration (injectable) would rather present to the Emergency Room (ER). However, studies from other centres within Nigeria have reported rates as high as 72.7%^{25,27,28}. Similarly, there have been reports of injection prescription rates as high as 48% from other African countries¹⁵. The high rate of injection use among these populations could be due to the erroneous belief that injections are more effective than oral medications. Though injectable has a faster onset of action, this practice is frowned at, as injections are more likely to cause adverse drug reactions when compared to other forms of treatments, and they often require expertise administration^{18,34}. The injectable is also costlier than oral medications; therefore, should be prescribed cautiously.

The WHO defined essential medicines as those that satisfy the priority health care needs of the population and recommended that a list of such medications should be available in every healthcare setting at all times, and 100% of the drugs prescribed should be from the essential drug list⁴⁰. In this study, 56.8% of prescriptions were prescribed from an essential drug list. This might be attributable to the fact that only 40% of the prescribers owned a copy of the essential drug list or the national drug formulary. Interestingly, a similar study in a tertiary hospital in Kano State, North-western Nigeria, reported that 94% of the drugs prescribed were from the essential list even though no copy of the list was available at the points of prescription²⁸. Dakhale et al. in a similar study amongst resident doctors and interns in a tertiary care teaching hospital in India, reported that only 10.5% had the national drug formulary available at their workplace¹⁷.

Studies that reviewed how prescriptions in Nigeria conform to international practices found out that the prescribers knew but hardly practised according to established guidelines^{21,26,29}. It is, therefore, instructive that 68% of our study respondents expressed interest in further education on rational drug use.

CONCLUSION

There is still some level of polypharmacy and a burden of inappropriate prescription of generic drugs in Primary Care. Hence, the use of essential drug formulary should be encouraged, and copies made readily available at health facilities. Continuing Medical Education on the rational use of medicines among doctors and other health care workers is encouraged with a regular audit of prescription practices in the health facilities.

Conflict of Interest: The authors have no conflicts of interest to declare.

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