Patterns and Errors of Medication Prescription among Patients with Chronic Medical Diseases attending Medical Outpatient Department of a Tertiary Hospital in Ilorin, Nigeria

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Abstract

A valid prescription is necessary for the appropriate usage of drugs. Inappropriate medicine has major consequences. Prescriptions written in medical practice are more prone to prescription writing errors. It is vital to promote rational drug use through researching drug use patterns and prescription errors. The goal of this study was to analyse prescription practices and contribute to better drug utilization.

We did a retrospective study on prescriptions generated in medical outpatient from 1st January, 2022 and 30th June, 2022. The prescriptions kept at the pharmacy department during the period of study were utilized to assess prescription patterns and errors. A total of 1211 prescriptions were evaluated, with 4632 medicines prescribed. The average number of medicines encountered per interaction was 3.82. There were 1154 medications administered by generic name (95.30%). In 1101 patient contacts, an antibiotic was prescribed (90.91%), while an injectable was administered in 88 encounters (7.27%). The essential medication list contained 1092 (90.17%) of the prescribed medicines. In 1211 prescriptions, 4963 errors of omission attributable to the physician were identified, resulting in an average of 4.08 errors per prescription.

There was inadequate compliance with World Health Organization (WHO) prescribing indicators and a significant rate of prescription errors. The prescription patterns were not consistent with WHO recommendations. The use of the Essential Drug List (EDL), low rates of generic prescribing, excessive antibiotic prescribing, and polypharmacy were all serious issues.

Keywords: Essential Drug List, Pharmaceutical utilization, Prescriptions, WHO recommendations.

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Introduction

The goal of medication administration is to treat or prevent disease in order to improve the quality of life of patients. The correct use of a medicine is essential for the treatment or prevention of a disease or any health issue, and this includes understanding the right drug for a patient at the right dose for suitable durations and for a specific clinical requirement.[1] The judicious use of necessary medications that are safe, effective, and inexpensive helps to improve health status,[2] while their improper use wastes money and lowers the quality of patient treatment.[3] A prescription is a legally binding document sent by a certified medical practitioner to a pharmacist that provides pharmaceutical instructions for a specific patient.[4] A prescription ought to comprise at least the following information, according to the World Health Organization (WHO): the prescriber's name, address, phone number, and signature or initials, the date the drug was prescribed, the generic name and vitality of the drug, the dosage form, the entire quantity of drug to be provided, and the patient's name, address, and age.[5] A good prescription must be simple and easy to understand, as well as provide crucial information.[6]

Irrational medication has become a worldwide problem. While a good pharmacological prescription is essential in patient care, an incorrect prescription can lead to ineffective and even harmful medicine. It can also aggravate or prolong illness, increase patient suffering, and increase the risk of harm.[7] In rare situations, irrational medicine prescribing and use might result in patient mortality. Wrong prescription behaviors are practiced by health care staff as a result of patient pressure, poor example from some colleagues, and drug business salesmanship.[8] It is critical to examine drug use patterns in developing countries using WHO drug use indicators[9,10] in order to encourage rational drug use. The Core prescription indicators are designed to assess the degree of polypharmacy, the inclination to prescribe generics, antibiotic usage and injection rates, and the proportion of medications recommended from the essential drug list.[2,10] Errors of prescription are classified into two types: omission errors and commission errors. Errors of omission characterize a prescription with missing information that is considered critical. These prescription errors are preventable, yet they have grown in hospitals

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throughout the world.

Research in Nigeria indicated that drug prescribing trends and patient care methods were improper at a tertiary healthcare institution, Federal Medical Centre, Lokoja, Kogi state.[11] Similarly, research on a medication prescription trend at the Aminu Kano Teaching Hospital in Kano, Nigeria, found incorrect prescribing.[12] Another research that investigated the quality of outpatient prescriptions in the University of Maiduguri Teaching Hospital's National Health Insurance Scheme found a significant rate of polypharmacy.[13] This implies that improper prescription continues to be an issue in Nigerian tertiary healthcare facilities.

The investigation of prescription patterns and errors has never been done previously at University of Ilorin Teaching Hospital (UITH). As a result, the current study will assist to identify prescribing trends and mistakes, which will lead to the development of a good health care policy, and enhance the quality of medication usage in the health facility.

Materials and methods

It was cross-sectional retrospective study designed to describe the current pattern of medication prescription in medical outpatient department of the hospital. The prescription papers were stored in the Pharmacy department of University of Ilorin Teaching Hospital after dispensing the drugs.

The study was conducted at the UITH, a 600-bed hospital in Ilorin, the state capital of Kwara, in Nigeria's North Central geopolitical region. UITH is a tertiary institution and a referral center for patients from Kwara and the nearby states.

The WHO recommendation is to include at least 600 prescriptions in a cross-sectional study to describe the current prescribing patterns, with a higher number if feasible because more trustworthy data are obtained with bigger sample sizes. The hospital's pharmacy staff appropriately stored all prescriptions written in all outpatient clinics.

A data capture form (DCF) for the study was created using the WHO prescribing indicator manual. The average number of prescription drugs per contact is one of the prescribing metrics, the percentage of prescriptions written under the generic name, the percentage of prescriptions written for antibiotics, the percentage of prescriptions written for injections, and the percentage of prescriptions written from the essential medicine list were all recorded in the DCF.

Utilizing the drug indicators advised by the WHO, the prescription pattern was assessed. The metrics include total prescription drug count, average prescription drug count, percentage of generic medicine prescriptions, percentage of prescriptions containing antibiotics, and percentage of prescriptions containing injectable medications. We excluded the prescription of intravenous fluids, blood, blood products, medical devices or equipment, and prescriptions for inpatients.

A random sampling method was used to choose the sample of prescriptions. Using a modified envelope method, a list of years from 2015 through 2021 was produced (strips of paper with each year labelled on it). The first year and month was chosen at random, and 2021 was the year selected and the chosen month was January.

Ethical approval was obtained from the Ethics and Research Committee of the University of Ilorin Teaching Hospital with approval number: ERC PAN/2022/04/0309

After manual verification and cleaning, data collected from the data capture forms were analyzed using statistical software SPSS Version 20.0 (Chicago, IL, USA). The results were displayed using the relevant means, frequencies, and percentages. Results were interpreted in accordance with the prescribed values by the WHO.

Results

We conducted a retrospective analysis and evaluated 4,632 medications prescribed in 1,211 prescriptions, as indicated in table 1. The mean number of medicines per prescription was 3.82. There were 1,154 medications administered by generic name (95.3%). In 1,101 patient contacts, an antibiotic was prescribed (90.9%), while an injectable was administered in 88 encounters (7.3%). The essential medication list contained 1,092 (90.2%) of the prescription medicines. Among the most often prescribed pharmaceuticals, 33.8% (n = 409) were antibiotics, 23.7% (287) were antimalarials, and 20.6% (249) were diabetes medications. Table 3 lists more often given medications.

In 1,211 prescriptions, 4,963 errors of

Table 1: Drug prescribing indicators at Medical Outpatient Department Clinic, UITH. (n = 1211)

Prescribing indicators	Number	Average/percentage	Ideal WHO value
Average number of drugs per encounter	4632	3.8	1.6-1.8
Percentage of drugs prescribed by generic	1154	95.3%	100%
Percentage of encounter with antibiotics	1101	90.9%	20.0-26.8%
Percentage of encounter with injections	88	7.3%	13.4-24.1%
Percentage for drugs from essential drug list	1092	90.2%	100%

Table 2: The most common prescribed drug classes at Medical Outpatient Department Clinic, UITH (N=1,211)

Prescribing indicators	Frequency (%)
Antibiotics	409 (33.8%)
Antimalarial	287 (23.7%)
Antidiabetics	249 (20.6%)
Antihypertensives	198 (16.4%)
Iron/Multivitamins	165 (13.6%)
Antiulcer/Antacids	154 (12.7%)
Antituberculosis	154 (12.7%)
Anxiolytics/Sedatives	110 (9.8%)
Thyroid drugs	109 (9.0%)
Diuretics	106 (8.8%)
Anti-tetanus	95 (7.8%)
Anticonvulsants	48 (3.9%)

omission attributable to the physician were identified, resulting in an average of 4.08 errors per prescription. Failure to disclose the prescriber's phone number was the most prevalent error in prescribing connected to the prescriber, accounting for 99.4% (1,204) of all prescriptions and 0.99 average errors per prescription. Table 3 lists all of the prescriber-related mistakes. Table 4 reveals a total of 126 drug-related omission mistakes per total medication delivered. The most prevalent omission mistake connected to the medicine was a failure to state dosage, which accounted for 4.1% (n = 50) of total drug prescribed.

Discussion

The average number of drugs per contact (3.82) was greater than the normal of 1.6-1.8. The percentage of contacts with antibiotics was higher than the WHO norm, and the percentage of encounters with

Table 3: Errors of omission related to prescriber at Medical Outpatient Department Clinic, UITH. (N=1,211)

Types of Errors	Number of errors (%)	Average error per prescription
Phone Number of Prescriber not mentioned	1204(99.4%)	0.99
Weight not mentioned	1192(98.4%)	0.98
Age not mentioned	1168(96.4%)	0.96
Sex of patient not mentioned	1093(90.3%)	0.90
Prescriber name not mentioned	122(10.1%)	0.10
Institution of Prescriber not mentioned	86(7.1%)	0.07
Prescriber signature not mentioned	61(5.0%)	0.05
Prescription date not mentioned	35(2.9%)	0.03
Patient name not mentioned	2(0.2%)	0.00
Total Error	4963	4.08

Table 4: Errors of omission related to drugs per total medicine dispensed at Medical Outpatient Department Clinic, UITH. (N=1,211)

Types of Errors	Number of errors (Percentage)	Average error per prescription
Dose not mentioned	50(4.1%)	0.04
Dosage form not mentioned	37(3.0%)	0.03
Frequency not mentioned	39(3.2%)	0.03
Total Error	126	0.1

injectable, generic medications, and pharmaceuticals given from the essential drug list were lower. Polypharmacy is measured by the average number of medications prescribed per encounter.[2] We found a high score of 3.82, indicating a high level of polypharmacy. This finding is consistent with prior research in Nigeria, which found a high (3.8) average number of drugs per interaction.[14] However, it contradicts the findings of other studies conducted in Sudan and Zimbabwe, which found low average drug counts of 1.4 and 1.3, respectively.[15,16]

Some of the factors that may be responsible for the high number of drugs prescribed per patient encounter include financial incentives for prescribers to prescribe more, insufficient therapeutic knowledge of the prescriber, among others. Polypharmacy increases drug interaction, adverse drug reactions, non-compliance, bacterial resistance, and financial pressure.[17] Appropriate drug prescription is thus important to avoid needless burden on patients' health and economy.

The total antibiotic prescribing rate per contact exceeded the WHO limit. Lower levels have been observed in tertiary hospitals in Western Nepal (28.3%)[18] and Nigeria (34.4%).[12] Other studies in Nigeria have shown lower values compared to our findings: Ilorin (45.0%)[19], Benin City (50.4%), Kano (67.7%)[20], and in private and public facilities (55 and 75%, respectively) in Warri.[21] The excessive usage of antibiotics might be attributed to patients' expectation, prescribers' assumption, and the absence of the hospital antibiotic policy.[2] The high percentage of antibiotics use implies that there should regulation and evidence-based appropriate antibiotic policy to prevent its consequences in health.

The percentage of medications given by generic name was 95.3%, which is near to but lower than the criterion determined to serve as ideal (100%).[22] Comparable research in Nigeria found that the percentage of medications given by generic name was low (58%) when compared to the standard and our results.[14] Furthermore, studies in Sudan, Zimbabwe, Ethiopia, and Tanzania revealed that 63%, 94%, 75.2%, and 82% of medications were given by generic name.[15,16,23,24] These levels are lower than both the WHO norm and our finding. The guideline on appropriate prescription advises prescribing in the generic name unless there is a specific cause or necessity for a special brand.[8,25,26]

The percentage of encounter with injection was 7.3%, which was lower than the WHO Ideal.[22] Low levels have also been found in Zimbabwe (11%) and India (8.3%)[16,27], although high values have been reported in Uganda (48%) and Sudan (36%) and Nigeria (26.9%)[28,29], and in the acceptable range in Indonesia (17%), Ecuador (17%), and Mali (19%).[30] The low rate of encounter with injections might be due to the fact that utilizing non-parenteral medicine is simple, cost-effective, and handy, whereas injections need skilled people. Our findings might potentially be explained by the context in which our research was conducted. Patients who are seen and tracked on a regular basis in outpatient departments or units are typically in good health, therefore the need for injections is usually limited. If the study had been done at the hospital's Accident and Emergency Department, the usage of injections would almost certainly be higher.

The prescription of drugs from the EML was 90.2%, which, while not insignificant, is less than the standard (100%).[23] Prescriptions from the essential medicines list were observed to be low in Central Nepal (21.3%)[31] and (2.8%).[18] Similar outcomes to ours have been reported at Hawassa University facility in Ethiopia[2] and a tertiary care facility in Nigeria.[12] Essential medications are affordable, high-quality, and safe and prescription from EML improves therapeutic benefits.[32]

Antibiotics were the most regularly prescribed medicine (33.8%), followed by antimalaria (23.7%) and antidiabetics (20.6%). Antibiotics were the most regularly given medicine in North Eastern Nigeria, according to a previous survey with a lower number (22.7%).[33] Antibiotic overuse leads to antibiotic resistance, which is a public health issue.

Malaria is prevalent in Nigeria, accounting for one-quarter of all cases in Africa.[34] More than half of Nigeria's population is expected to have at least one bout of malaria per year. This accounts for approximately 20% of all hospital admissions, 30% of outpatient visits, and 10% of all hospital mortality.[35] This might explain why antimalarial drugs were also frequently prescribed in our study. Presumptive diagnosis remains the most common method of determining a patient's malaria status[36] and therefore giving antimalarial medications.

Almost all prescriptions included the patient's name. There were a few prescriptions that did not include the prescriber's signature, the name of the health facility, or the date of the prescription. The prescriber's name and signature were lost in 10.1% and 5.0% of prescriptions, respectively, while the phone number was omitted in 99.4% of prescriptions. Comparable research done in tertiary care hospitals in India and Nepal discovered that the prescriber's name and signature were overlooked in 87.5 and 19.2% of prescriptions, respectively.[32] The prescriber's information is critical, especially when the prescription medications are opioids, hormone therapies, or antibiotics.[37] It is difficult for a pharmacist to communicate with a physician in circumstances where there is uncertainty on writing and by patients for

follow up when the prescribers' data are missing. Patients' age, weight, and gender were all significantly missing in 96.4%, 98.4%, and 90.3% of prescriptions, respectively. These details are critical since they are required by pharmacists when giving medications to guarantee proper drug usage.

This study found that 4.1% of the dose, 3.0% of the dosage form, and 3.2% of the frequency were missed. Comparable research in Tanzania found higher rates of omission, with 67.1% and 3.8% of prescriptions missing dosage and frequency, respectively.[38] Our results were also lower than those in Ethiopia, which found that dose, frequency, and dosage form were missing in 72.6%, 15%, and 67.3% of prescription drugs in Ethiopian government hospitals, respectively.[39]

However, guaranteeing that the proper drug at the right dose and form is given to the patient by the pharmacist or dispenser becomes challenging when the dose and dosage form of drug is not written in the prescription. Furthermore, in healthcare institutions where pharmacists are overburdened by the number of patients they see on a daily basis, they may be unable to be comprehensive with prescription forms in order to manage these errors. Incorrect dosing, frequency, and duration can result in treatment failure, resistance, and adverse effects. Good prescription practice is critical in minimizing these errors in medicine delivery to the barest minimum.[8,40]

Conclusions

There is inadequate compliance with WHO prescribing indicators and a significant rate of prescription errors. The prescription patterns were not consistent with WHO recommendations. The use of the Essential Drug List, low rates of generic prescribing, excessive antibiotic prescribing, and polypharmacy were all serious issues. In order to promote rational use of medication, we advised appropriate training of prescribers and policy formation.

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Conflicts of interest

None declared

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