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Drug prescription pattern among patients on national health insurance at a tertiary care hospital in north east Nigeria

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Abstract

The quality of drug prescriptions is one of many determining factors of patient treatment outcomes. Irrational drug use is a significant contributor to adverse reactions and its associated morbidity and mortality among patients. In addition, it also increase the cost of medical care, reduce affordability of drugs and impose unnecessary financial cost for medical services. Evaluation of prescribing practices using appropriate tools is one of the many methods of assessing the quality and rational of drug use in healthcare facilities. The major objective of this study is to determine level of polypharmacy and drug prescribing pattern using WHO core indicators.

This was a cross sectional retrospective study of prescriptions obtained from pharmacy dispensing records. A total of 5079 prescriptions over a two year period were retrieved using simple random sampling method and relevant data extracted for analysis.

The result showed that antibiotics, analgesics and haematinics were the most prescribed class of drugs. The number of drugs per encounter and percentage of prescriptions with antibiotics was higher than WHO core indicators. Prescription of drugs from essential drug list and in generic names was low. This result indicated that wide gap remain between recommended standard of rational drug use and drug prescription practices that needs to be bridged if patients are to derive optimal benefits therapy.

Prescribing practices were not in alignment with WHO core indicators of rational drug use. There is need to strengthen oversight of prescription practices and education of prescribers to improve drug prescription habits.

Keywords: Polypharmacy; Rational drug use; Drug utilization; Prescribing pattern; WHO core indicators; Essential drug list

1. Introduction

Drug utilization study is one of the many methods that has been widely used to determine whether or not drug prescriptions comply with the principles of rational drug use, particularly with regards to safety, efficacy, cost effectiveness and positive clinical outcomes. The way medicines are prescribed and used affect either positively or negatively morbidity, mortality and quality of lives of patients as well as their socioeconomic wellbeing [1]. So, promoting rational use of drugs is a critical component of quality of healthcare services. Healthcare providers are expected to exercise sound clinical judgement and take extreme care during medication therapy management [2]. Irrational drug prescriptions is a major global public health challenge, particularly in low income countries where financial and physical access to quality assured medicines is reported to be low [3,4,5,6,7].

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Drug prescription pattern vary widely within and between healthcare facilities as well as between countries [8]. A number of factors have been reported to influence drug prescribing habits, some of which include socio-demographic characteristics of patients, availability of medicines, quality of health personnel and health systems to mention but a few [9,10]. A number of other studies also reported that drug prescription pattern is also influenced by morbidity pattern, age and reproductive status of patients [11,12,13].

Global data indicate that up to half of all medications are irrationally prescribed and inappropriately used [14]. Literature evidence also suggest that many drug prescriptions in developing countries do not meet up with criteria of being considered rational [3,7]. In an effort to improve evidence based improvement in drug prescribing quality and rational use in poor resource settings, the World Health Organization (WHO) released core indicators that outlined a number of criteria that can be used to assess prescription quality. The indicators emphasized the use of generic drugs, use drugs from country's essential drug list, low injectable drugs use, reduced polypharmacy and antibiotic use. So non-conformity with the indicators would be a pointer to irrational drug prescribing habit in health [15,16,17]. A review of many studies in developing countries indicate that more than half of all prescriptions in both private and public health facilities are not in compliance with WHO recommended standards of good prescribing practice [7].

Irrational drug prescribing in Nigeria is widely reported in literature to be high in both public and private health facilities [18,19,20,21,22,23]. The consequences of irrational drug use has been reported to include unsafe and ineffective therapies, exacerbation of symptoms, increased mortality, distress and harm to patients [20]. In addition, there is also increased cost of care for patients and healthcare system and unfortunately death may result in some instances [15]. There is clear evidence that irrational antibiotic use is one of the many factors driving microbial resistance [24,25,26,27]. In recent years, microbial resistance is becoming an acute problem in low and middle income countries where a combination of inadequate regulatory controls and poor healthcare systems appear to encourage antibiotic misuse [28,29].

Among geriatric patients, the potential for adverse drug events and drug induced emergency hospital visits is closely associated with irrational drug prescriptions [30,31,32]. When rational drug prescription principles is appropriately observed, it is expected to promote safe and cost effective medication therapy to all categories of patients that will result in the best possible clinical outcomes.

2. Methods

2.1. Setting

The study was carried out in the pharmacy department of University of Maiduguri teaching Hospital using prescription records of patients on national health insurance scheme [NHIS].

2.2. Study design

This was a cross sectional retrospective survey of two year prescription records in the NHIS pharmacy department of the hospital.

2.3. Sample size/sampling

A total of 5079 prescriptions of patients enrolled into the national health insurance scheme that have met inclusion criteria were randomly selected from two year prescription records [2020 – 2021].

2.4. Data collection

Data was extracted from prescription records into data collection form for analysis.

2.5. Data analysis

The data was entered Microsoft excel and cleaned after which it was loaded into SPSS 21 for descriptive statistics. The results was expressed as mean, averages and percentages.

2.6. Ethical approval

This was obtained from the human research ethics committee of University of Maiduguri teaching hospital.

3. Results

The average age of patients was 31.2 years; a greater proportion of them were below 50 years of age, while those above 60 years and below 10 years accounted for 20% of sampled patients [Figure1].

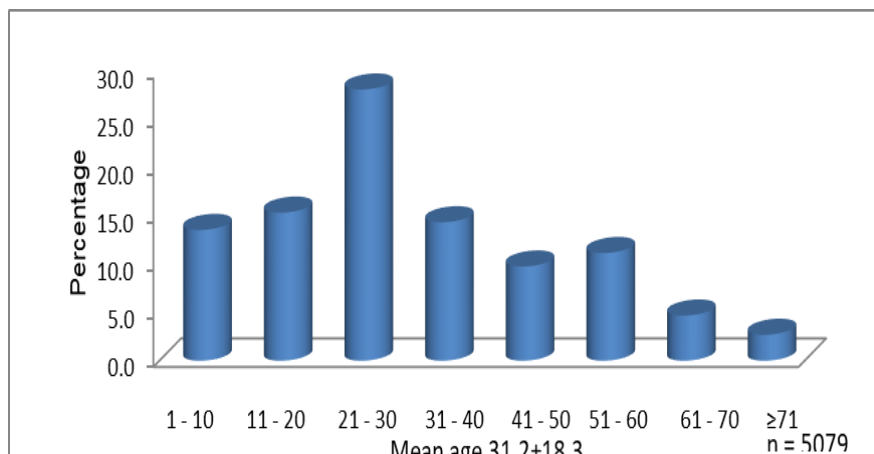


Figure 1 Age distribution

Prescription records showed that antibiotics were found in over three quarters of all prescriptions. This was followed by analgesics, antimalarials and haematinics which accounted for 67.7, 45.4 and 29.7% of prescriptions respectively [Figure 2].

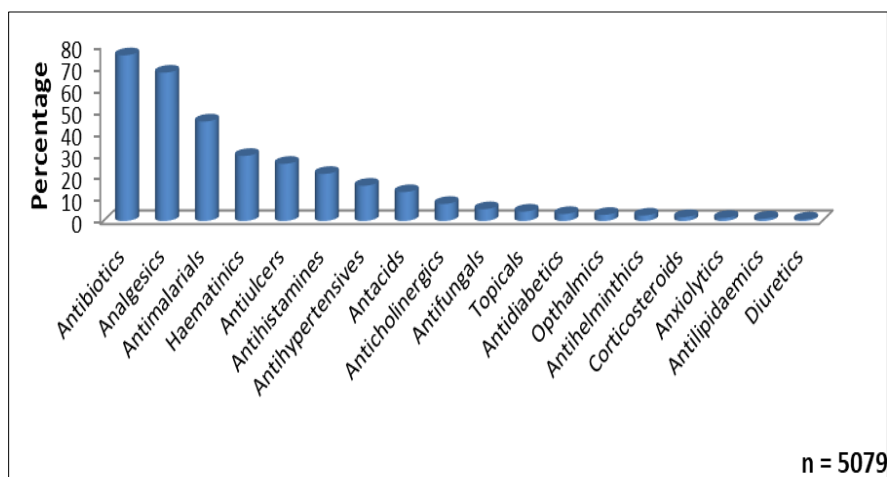


Figure 2 Class of prescribed drugs

Table 1 WHO prescribing indicators

Description	Result	WHO values
Average number of drugs per encounter	3.7	1.6 – 1.8
Percentage of encounters with antibiotics	75.6%	20 – 26%
Percentage of encounters with injection	2.5%	13.4 – 24.1%
Percentage of drugs prescribed in generic	50.4%	100
Percentage of drugs prescribed from essential drug list	69.4%	100
Total number prescriptions	5079	
Mean number of drugs per prescription	3.7 ± 2.3	

The prescriptions of antibiotics, number of drugs per encounter and generic prescriptions were all higher than values recommended by WHO core indicator. The same was also true of prescription of drugs from Nigeria's revised essential drug list [Table 1].

Polypharmacy was observed in over three quarters of all prescriptions [≥ 4 drugs] [Figure 3].

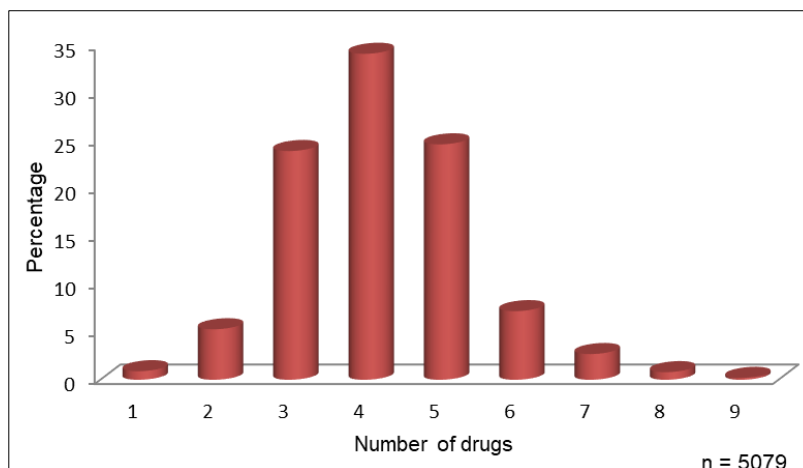


Figure 3 Number of drugs per prescription

4. Discussion

Drug prescription pattern is a reflective measure of a number of complex factors that influence physicians' approach towards disease treatment. While there is no universally accepted standards of prescription quality, physicians often rely on their individual expertise, clinical experience, patients peculiarities, formulary restrictions and other socio-cultural determinants to make drug therapy decisions [33,34,35]. The result of this study showed that average number of drugs per encounter was comparable to similar studies around the country [19,36,37,38], though higher than WHO recommendation. Similar studies around the world have also reported high figures [2,39,40,41], though some studies reported values that fall within the WHO recommendation [43, 44, 45]. The high number of drugs per encounter observed in this study might be a reflection of poor internal control over prescribing habits and disregard to principles of rational drug use among prescribers.

It has been suggested that patients on health insurance often tend to receive more medications compared to those who pay for services as out of pocket expenditure [21], so financial motivation may be a possible reason for this high level of polypharmacy. In addition, multiple morbidities among the aged may make polypharmacy inevitable, thus making it a possible contributory factor to the high level of polypharmacy observed in this study [46,47]. The level of polypharmacy in this study was comparable to previous studies [48 - 49], though conflicting figures have also been reported [39]. Why polypharmacy may not be totally avoided, it may increase the likelihood of adverse drug reactions, drug interactions and nonadherence.

The class of drugs frequently prescribed included antibiotics, analgesics and antimalarials, though other drugs were also found, but in smaller percentage. The high prescription prevalence of antibiotics was similar to many studies around the world [41,50,51,52], although some studies reported lower figures [39, 45]. This high level of antibiotic use may be driven by other factors other than clinical needs and considerations, which can be regarded as irrational use [53,54].

The percentage of encounters with injectable drugs were well below the WHO recommendation similar to a previous study [15]. In Nigeria, a number of studies reported much higher prescription of injectable medications [33,55]. The probable reason for low use of injections may be due to the fact that majority of patients were outpatients and this route of drug administration will be the most convenient. This observation was previously reported in a study which noted that outpatients were usually prescribed less injectable drugs compared to in-patients [56].

Generic prescription of drugs was well below WHO standard as was reported in several studies in Nigeria [36,57,58], although some studies reported much higher figures of between 80 - 98% generic prescription rate [43,59,60,61]. The use of generic prescription is intended to significantly reduce cost of medications as they are known to be many times

cheaper than their innovator brands. The prescription of innovator brand prescriptions observed in this study has serious implications for affordability of medications.

The prescription of drugs from Nigeria's essential drug list was also low; this has consistently been reported in other studies [36,37,62]. The implication of this is that prescribers were non-compliant with the country's national health policy which emphasized prescribing using drug generic names. This may be due to the absence of hospital formulary that is expected to offer some guidance on choice of drugs. Therefore prescribers were left under the influence of other factors many of which may include non-clinical determinants.

5. Conclusion

Drug prescription pattern was not in alignment with rational drug use indicators. There is need to reduce over prescription of antibiotics as well as polypharmacy as they tend to negatively affect therapy outcomes.

Compliance with ethical standards

Acknowledgments

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Disclosure of conflict of interest

The authors declare no conflict of interest.

Statement of ethical approval

This study did not involve human subjects and has followed all ethical procedures during the study.

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