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Drug Use in the National Health Insurance Scheme at a Tertiary Hospital in the South East Nigeria

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Authors' contributions

This work was carried out in collaboration between all authors. Authors RNO and POE designed the study. Author RNO performed the statistical analysis, wrote the protocol and the first draft of the manuscript. Authors RNO, CN and POE managed the analyses of the study. Author RNO managed the literature searches. Authors CN and POE guided the data collection. Author RNO managed the data collection. All authors read and approved the final manuscript.

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ABSTRACT

Background: Due to increased out-of-pocket spending on health care by Nigerians, National Health Insurance Scheme (NHIS) was created to protect families from the financial hardship of huge health care bills among other objectives.
Aim: The objectives of the study were to investigate the drug use practices and overall prescribing pattern in the NHIS at a Tertiary Hospital in Nigeria.
Methods: Retrospectively, randomly sampled 1200 out-patient's NHIS prescriptions were evaluated using WHO core drug use indicators. Prospectively, a conveniently sampled 120 patients each at General Out-Patient Department (GOPD) clinic, NHIS, and GOPD dispensing pharmacy

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outlets were observed during consultations and interviewed before leaving pharmacy to assess the patient care indicators. Data were analyzed using descriptive statistics and independent samples t-test.

Results: The average number of drugs per prescription, encounters with an antibiotic, and drug prescribed by generic name and from NHIS essential drug list were 4.2±1.8, 31.6%, 52.8% and 66.1% respectively. In NHIS and GOPD dispensing pharmacy outlets, the pharmacists' average prescriptions assessment time were 9.24 seconds and 64.03 seconds with significant difference ($P < 0.05$), whereas the average medication counselling time were 15.6 seconds and 34.7 seconds respectively with significant difference also ($P < 0.05$). Dispensed drugs that were properly labelled were higher in NHIS than in GOPD (62.0% vs 20.4%). Patients' correct drug dosage knowledge was also higher in NHIS than in GOPD (37.5% vs 23.3%).

Conclusion: Poor drug use practices including poly-pharmacy, overuse of antibiotics, lack of adherence to generic prescribing, poor conformity to NHIS essential drug policy, inadequate prescription assessment, inadequate patients' medication counselling, incomplete labelling of drugs, and inadequate patients' knowledge of correct drug dosage were apparent. Antihypertensive drug class was the most prescribed drug class.

The findings of this study have provided first time evidence of irrational drug use in NHIS in the South East Nigeria. Therefore, we recommend training and re-training of healthcare providers in the health insurance scheme on rational drug prescribing and dispensing.

Keywords: Drug use idicators; National Health Insurance Scheme; Nigeria; prescribing patterns.

1. INTRODUCTION

The direct cost of healthcare and medical services, and added indirect costs deterred poor people from accessing health care. Those who eventually seek care often had to finance health spending through out-of-pocket payments and loans, or sell properties, goods or labour to meet the costs. Costs are often catastrophic, exacerbating the extreme poverty of those least able to afford it. Out-of-pocket expenses for health care deter poorer people from using services leading to untreated morbidity [1]. Lack of financial protection for the costs of health care means that majority of people are pushed below the poverty line each year by payments for health care [2]. The larger the proportion of health care that is paid out-of-pocket, the larger the proportion of households that are faced with catastrophic health expenditures [3] and many more will not seek care because they lack the necessary funds. In response to such deficiencies in the health care systems, federal government of Nigeria introduced National Health Insurance Scheme (NHIS) which became operational in 2005.

NHIS was established as a corporate organization under Act 35 of 1999 to provide social health insurance in Nigeria where health care services of contributors are paid from the common pool of funds contributed by participants of the scheme [4]. The purpose of health insurance is three fold: Increase access and use by making health services more affordable, improve health status through increased access and use, and mitigate the financial consequences of ill health by distributing the costs of health care across all members of a risk pool. Tertiary health care facilities in Nigeria have dedicated pharmacy that solely attends to patients enrolled in the health insurance scheme. NHIS patients access their medicines and surgical items from this pharmacy with 10% co-payment of the total cost of the medicines and/or surgical items.

Studies raising concerns of drug misuse or irrational use has been conducted in other geopolitical regions of Nigeria. Previous studies conducted in the South West reported prevalence of poly-pharmacy and low prescribing of medicines by generic names [5,6]. In the North West, a similar study revealed poly-pharmacy, over use of antibiotics and Injections, and low rate of generic prescribing [7]. Another previous study conducted in the North Central concluded that pharmaceutical prescribing patterns and patient care practices were found to be inappropriate [8], whereas studies conducted in the North East that evaluated NHIS out-patients' prescriptions reported poly-pharmacy [9,10], overprescribing of antibiotics, lack of compliance with the principles of NHIS essential drugs, and generic prescribing [10].

Rational use of drugs in NHIS in the south eastern Nigeria has not been investigated, hence

the need for this study. The objectives of this study were to investigate drug use practices, and overall prescription pattern in NHIS in the setting studied.

2. MATERIALS AND METHODS

2.1 Setting

This study was carried out in the NHIS dispensing pharmacy outlet of the University of Nigeria Teaching Hospital (UNTH), Enugu. UNTH is a tertiary health facility of about 500 bed capacity with personnel made up of professionals and non–professionals. It serves as the Teaching Hospital for the Faculty of Medicine of the University of Nigeria. The department of pharmaceutical services which comprises twelve (12) dispensing pharmacy outlets is a service arm of the tertiary hospital. It provides pharmaceutical services to both the in-patients and out-patients. NHIS dispensing pharmacy outlet is one of the twelve, it opens to patients throughout the workdays but the peak hours for out-patients transactions is from 10.00 am to 1.00 pm. Drugs (except injections, creams, ophthalmic drugs, ear preparations, and surgical items which are accessed from other dispensing pharmacy outlets under NHIS coverage) prescribed for patients under NHIS are accessed from this dispensing pharmacy outlet. In a situation where the prescribed NHIS drugs were not available in the hospital, insured patients are compelled to purchase such drugs out-of-pocket from private pharmacies outside the hospital premises. Prescriptions filled at the NHIS dispensing pharmacy outlet are also stored here. As at time of this study, the average number of prescriptions sheets dispensed per day was 50 prescriptions. Four (4) pharmacists, two (2) intern Pharmacists, one (1) pharmacy technician, one (1) pharmacy assistant, and one (1) clerk were working in this pharmacy outlet.

2.2 Study Design

Both prospective and retrospective study designs were used in assessing the different indicators based on WHO core drug use indicators [11]. Prospectively, convenient sampling was used to select 120 patients each at the GOPD clinic, GOPD dispensing pharmacy outlet, and NHIS dispensing pharmacy outlet respectively for patient care indicators assessment. Enquiries were made to assess the health facility indicators. Retrospectively, systematic random sampling was used to select 1200 prescriptions issued to different NHIS out-patients that attended the health facility between January and December 2013. A sampling interval of 10 was used to select prescriptions used for this study with ordinary balloting used for the first pick.

2.3 Research Instruments

The data were collected by the use of forms. Prescribing indicator form is made of columns for date of prescriptions, patient age in years, gender, number of drugs prescribed, number of drugs prescribed by generic name, encounter with an antibiotic prescribed, and encounter with an injection prescribed was coded 0 = No, 1 = Yes, number of drugs prescribed from NHIS essential drug list and category of medicine prescribed. Patient care form consists of columns for serial number, patient identifier, physician's consulting time in minutes, pharmacist's prescription assessment time in seconds, revenue time in minutes, counselling time in seconds, number of drugs prescribed, number of drug dispensed, number of drugs properly labelled, patient correct knowledge of dosage was coded 0 = No, 1 = Yes. Health facility indicator form consists of columns for availability of a copy of NHIS essential drug list and 12 commonly used key drugs which were coded read "Yes" for availability and "No" for unavailability. NHIS Healthcare Providers Service Price List [12] and digital watch were also used.

2.4 Data Collection

The prescription sheets of the twelve months period of 2013 were collected from the NHIS dispensing pharmacy outlet of the hospital. Required information for pharmaceutical prescribing (date of prescriptions, patient age in years, gender, number of drugs prescribed, number of drugs prescribed by generic name, encounter with an antibiotic prescribed, encounter with an injection prescribed, number of drugs prescribed from NHIS essential drug list and category of medicine) from the sampled prescriptions were abstracted into data collection forms. Data on patient care in the health care facility were gathered by recording the time between entering and leaving the consultation room (waiting time was not included for physician's consultation time); the time between entering pharmacy to collect drugs and leaving, (waiting time was also not included for medication counselling time); whether or not the drugs were actually dispensed at the pharmacy

units; information on the number of drug packages whether or not they contain at least patient name, drug name and when the drug should be taken; data on the ability of patients to report the dosage schedule for all dispensed drugs were recorded respectively.

For the availability of a copy of the essential drug list at the point of prescribing and dispensing, and availability of key drugs, "Yes" was recorded when available and "No" when absent.

2.5 WHO Core Drug Use Indicators

2.5.1 Prescribing indicators

a) Average number of drugs per encounter (the total number of different drug products prescribed divided by the number of encounters surveyed).
b) Percentage of drugs prescribed by generic name (the number of drugs prescribed by generic name divided by the total number of drugs prescribed, multiplied by 100).
c) Percentage of encounters with an antibiotic prescribed (the number of patient encounters during which an antibiotic was prescribed divided by the total number of encounters surveyed, multiplied by 100).
d) Percentage of encounters with an injection prescribed (the number of patient encounters during which an injection was prescribed divided by the total number of encounters surveyed, multiplied by 100).
e) Percentage of drugs prescribed from NHIS essential drug list (the number of products prescribed from NHIS essential drug list divided by the total number of drugs prescribed, multiplied by 100).

2.5.2 Patient care indicators

a) Average consultation time (the total time for a series of consultations divided by the actual number of consultations).
b) Average pharmacists' prescription assessment time (the total time spent for assessing prescriptions of a series of patients divided by the number of encounters).
c) Average pharmacists' costing time (the total time spent to cost prescriptions of a series of patients divided by the number of encounters).
d) Average patients' revenue time (the total time spent to make payment for a series of patients divided by the number of encounters).
e) Average dispensing counselling time (the total time spent for dispensing counselling to a series of patients divided by the number of encounters). In this study, average dispensing counselling time is the average time patients spent with pharmacists (average pharmacist-patient contact time). Waiting time was not included.
f) Percentage of NHIS essential drugs actually dispensed (the number of drugs actually dispensed at the health facility divided by the total number of NHIS essential drugs prescribed, multiplied by 100).
g) Percentage of drug packages adequately labelled (the number of drug packages adequately labelled divided by the total number of dispensed drug packages). In this study, drug name, dose, frequency, and patients' name were each assigned score of zero (0) for its absence on the drug package and one (1) for its presence. Therefore, a total score of four (4) for a patient was considered adequate while a total score less than 4 (four) was considered inadequate.
h) Patients' knowledge of correct dosage (the number of patients who can adequately report the dosage schedule for all drugs divided by the total number of patients interviewed, multiplied by 100). Drug dose, frequency and duration of administration were scored zero (0) each when incorrect and one (1) when correct. Therefore, a total score of three for each patient was considered correct knowledge of drug dosage while a total score of less than 3 was considered incorrect dosage knowledge.

2.5.3 Facility indicators

a) Availability of copy of EDL (yes or no).
b) Availability of key drugs (the number of specified products actually in stock divided by the total number of drugs on the check list of essential drugs multiplied by 100).

2.6 Outcome Measured

WHO reference [13] was used to measure the following outcomes: (a) Average number of drugs per encounter measured the degree of poly-pharmacy, (b) Percentage of drugs prescribed by

generic name measured tendency of prescribers to prescribe by generic name, (c) Percentage of encounters with an antibiotic prescribed measured the overall level of overuse of antibiotics, (d) Percentage of encounters with an injection prescribed measures the overall level of overuse of injections, (e) Percentage of drugs prescribed from NHIS essential drug list measured the degree to which practices conform to national health insurance policy, as indicated by prescribing from the NHIS essential drug list, (f) Availability of copy of NHIS essential drug list indicates the extent to which copies of the essential drug list are available at the health facility, (g) Average consultation time measured the adequacy of consultation and prescribing, (h) Average counselling time measured the adequacy of patients medication counselling, (i) Percentage of drugs actually dispensed measured the degree to which the health facility is able to provide the drugs which were prescribed, (j) Percentage of dispensed drugs adequately labelled measured the degree to which dispensers record essential information on the drug packages dispensed, (k) Patient's knowledge of correct dosage measured the effectiveness of the information given to patients on the dosage schedule of the drugs they received, (l) Availability of key drugs measured the availability of key drugs recommended for the treatment of some common health problems at the health facility.

2.7 Data Analysis

Data generated from the prepared data forms were analyzed using SPSS version 17 (Chicago, IL, USA), after manual verification and cleaning. The values for the investigated indicators were calculated as previously reported under WHO core drug use indicators. Descriptive statistics (means, standard deviations and percentages) was used. Rates of agreement between different variables in this study were calculated with Students' test for independent samples. A value for $P \leq 0.05$ was considered statistically significant.

3. RESULTS

Seven hundred and fifty one (62.6%) prescriptions were written for females patients. The mean age of the patients was 27.4 ± 24 years (range, 0 to 86 years). Majority of the patients that their ages were either omitted or written as adult were females (22.0%). However, majority that had their ages written on the prescription sheets were also females (12.3%) in the age group of 45-54 years (Table 1).

Table 1. Prescription frequencies by age group and gender (N = 1200)

Age group (years)	Female n (%)	Male n (%)
≤ 5	21(1.8)	27(2.3)
6-14	34(2.8)	53(4.4)
15-24	14(1.2)	13(1.1)
25-34	80(6.7)	20(1.7)
35-44	139(11.6)	30(2.5)
45-54	148(12.3)	58(4.8)
55-64	47(3.9)	83(6.9)
≥ 65	4(0.3)	26(2.2)

A total of 4981 drugs were prescribed in the 1200 patient encounters evaluated with an average of 4.2±1.8. Seven hundred and fifty two (62.7%) encounters had at least 4 drugs prescribed while 52.8% of drugs were prescribed by generic names. In 31.6% of encounters, an antibiotic was prescribed. Injections were prescribed in 1.6% of encounters while 66.1% of all the drugs prescribed were listed in the NHIS essential drug list, (Table 2).

The frequency distribution of prescribed medications showed that antihypertensives, vitamins, and analgesics were the most frequently prescribed classes of drugs at the NHIS of the setting studied. Of all the drugs prescribed, 7.7% and 7.6% were anti-platelets and antibiotics respectively, (Fig. 1).

With regard to the patient care, an average of 18.6 minutes was spent by the physicians assessing the patients' conditions and prescribing medications for outpatients in the health facility. Average prescription assessment time was significantly much lower in NHIS when compared with GOPD (9.2 seconds vs 64.0 seconds). Average prescription billing time was also significantly lower in NHIS (65.2 seconds) than in GOPD (127.1 seconds). The average time spent by a patient to pay for drugs was significantly higher in NHIS than in GOPD (5.7 minutes vs 1.8 minutes). Average medication counselling time varied between the two pharmacies, it was significantly shorter in the NHIS than in the GOPD (15.6 seconds vs 34.7 seconds). Percentage of drugs actually dispensed was higher in the NHIS than in the GOPD (92.0% vs 70.2%). More of the dispensed medications were properly labelled in NHIS than in GOPD (62.0% vs 20.4%). The lower value

recorded in the GOPD was due to the fact that names of the patients were not written on the labels of the majority of the dispensed drugs. Value of the patient's knowledge of correct dosage was relatively higher in NHIS than in GOPD (37.5% vs 23.3%), (Table 3). Ten out of the fourteen key essential drugs (71.4%) were available in the health facility. There was no copy of the Essential Drugs List in both the NHIS dispensing pharmacy outlet and GOPD section of the hospital although; improvised electronic version was used for billing of prescriptions at dispensing pharmacy outlets of the health facility.

Table 2. Core prescribing indicators in NHIS

Prescribing indicators	Value
Average number of drug per prescription	4.2±1.81
Drugs prescribed by generic names (%)	52.8
Encounters with an antibiotic prescribed (%)	31.6
Encounter with an injection prescribed (%)	1.6
Drugs prescribed from NHIS Essential Drug List (%)	66.1

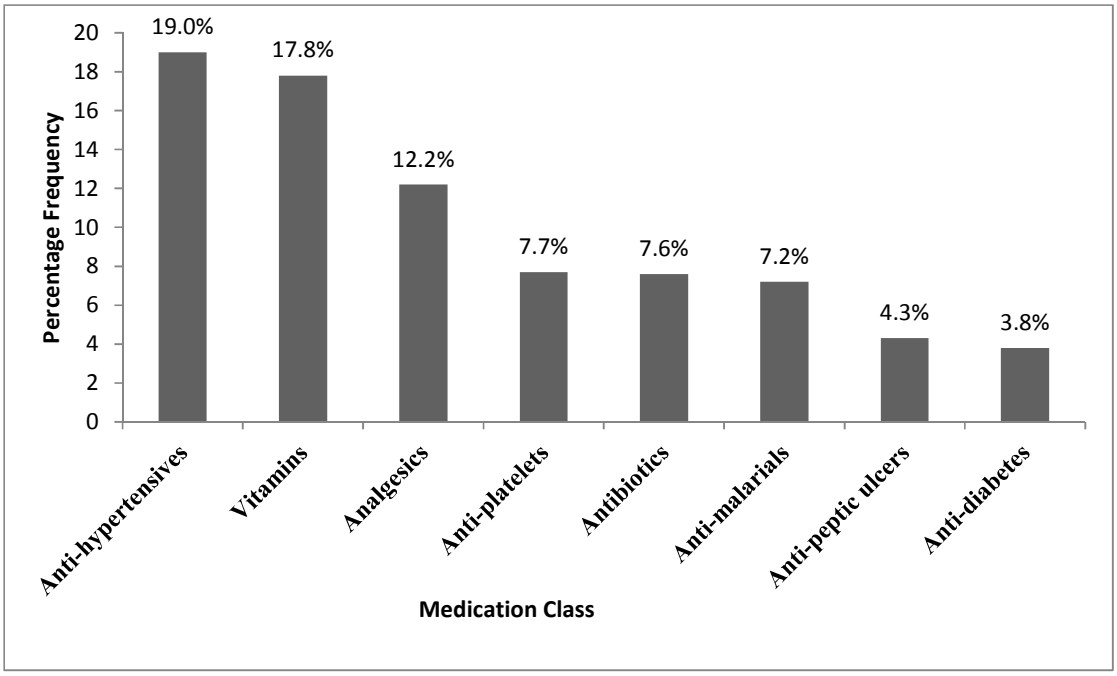

Fig. 1. Frequency distribution of the most commonly prescribed classes of medications

Table 3. Patient care indicators at the heath facility

Patient care indicators	NHIS	GOPD	P value
Average prescription assessment time (seconds)	9.24±6.78	64.03±20.34	0.000
Average medicine billing time (seconds)	65.20±19.98	127.13±54.64	0.000
Average payment time (minutes)	5.70±1.73	1.83±1.18	0.000
Average counseling time (seconds)	15.61±9.08	34.72±26.84	0.000
Average doctor's consulting time (minutes)	-	18.61±8.84	-
Drugs dispensed (%)	92.0	70.2	-
Drugs properly labelled (%)	62.0	20.4	-
Patients' knowledge of correct drug dosage (%)	37.5	23.3	-

Mean±Standard Deviation; P values (Independent-Samples T Test)

4. DISCUSSION

Irrational drug use was found in the scheme evident by poly-pharmacy, overuse of antibiotics, lack of adherence to generic prescribing, poor conformity to NHIS essential drug policy, inadequate prescription assessment, inadequate patients medication counselling, incomplete labelling of drugs packages, and inadequate patients' knowledge of correct drug dosage.

4.1 Demographics

Females constitute roughly half of the Nigerian population. Therefore, gender distribution of the present study did not reflect the sex ratio of the whole population in Nigeria. The possible explanation of study finding is that Nigerian males might shrug of disease symptoms as normal everyday muscle aches or normal occurrence, whereas females are generally more likely to identify disease symptoms in the first place and are prompted to seek health care.

4.2 Drug Prescribing Indicators

The average number of drugs per prescription (4.2 drugs) reported by this study is comparatively high in the light of WHO reference range values of 1.6-1.8 drugs per encounter [13]. This study finding is comparable to the value (3.95) got from a similar study in the same scheme in a different geopolitical region of Nigeria [9]. These findings may confirm high incidence of poly-pharmacy in the Nigerian NHIS, which could be as a result of treatment based on symptoms without definitive diagnosis and non-compliance to the scheme treatment protocol or ill implementation of drug use guidelines of the scheme due to lack of monitoring or pressure from the patients on the doctors to prescribe other drugs for them. This is because the scheme is highly subsidized and patients pay only 10% of drug cost and therefore, is subject to abuse by patients. In order, to substantiate irrational prescribing in the scheme, other non NHIS Nigerian studies [6,14] had reported lower values. High number of drugs prescribed to a patient increases the risk of drug non-adherence, drug interactions, and increased cost of healthcare. Poly-pharmacy is one of the causes of adverse drug reactions (ADRs).

A little above one half of the drugs prescribed were by generic names contrary to the WHO reference value of 100% despite the fact that NHIS was established on the principle of generic prescribing in order to reduce the cost of healthcare, increase availability and accessibility of drugs to the beneficiaries. The 100% recommended by WHO is realistic and attainable, but commitment is needed on the part of the managers and the prescribers in the scheme. The finding of this study is consistent with the value of 51.5% reported by another NHIS study carried out in Maiduguri [10]. These findings reveal that inadequate generic prescribing is prevalent in the scheme. Generally, lack of generic prescribing is still a perennial problem in Nigeria. This may be attributed to prescribers convenience with brand names or inadequate knowledge of generic names of drugs and increased aggressive marketing by sales representatives of pharmaceutical companies or importers who do all within their ability, a times even induce prescribers with financial benefits and gifts, in order to compel them to prescribe trade names of their company's drugs against the ethics of the medical practice and the principle of rational pharmacotherapy. Lack or inadequate generic prescribing increases cost of health care expenditure and reduces accessibility of drugs.

On evaluation of encounter with an antibiotic, this study reported a higher value of 31.6% as against the WHO reference range of 20.0% - 26.8% [13], but consistent with a previous NHIS study in the north eastern Nigeria that reported 56.2% [10]. The findings of these NHIS studies are in agreement with the previous non-NHIS Nigerian studies that reported 43.8% and 51.1% respectively [8,14] and inconsistent with an Indian study that reported a value of 14.9% outside the health insurance scheme [15]. This highlights that overprescribing of antibiotics is still a problem in Nigeria. Over prescribing of antibiotics could be due to overestimation of infections by prescribers and pressure from patients on the prescribers to prescribe antibiotics for symptomatic relief of illness. Overuse of antibiotics leads to emergence of drug resistance micro-organisms which constitute a major public health problem. Conserving the existing antibiotics is far more cost effective than developing new ones which will still be subject to resistance in due time. Over use of antibiotics could also lead to increased side effects and increased cost of healthcare. Therefore, physicians need to be educated more not only about the evidence-based guideline of when and when not to prescribe antibiotics, but how to feel confident in

their decisions, and how to deal with patients who ask about, request, or even demand antibiotics. Patient education is also critical. Individual prescribers could benefit from a support structure, in their practice or institution. This can include reviews of prescribing practices, educational materials for patients, and feedback to improve prescribing practices.

Drugs prescribed from NHIS essential drug list reported by this study was far below the WHO reference value of 100%, but consistent with the value (67.1%) reported by a previous NHIS study [10] and inconsistent with the finding of 82.3% by another study outside the scheme [8]. The finding of this study revealed that the prescribing practices of the prescribers in the setting studied did not conform to the NHIS essential drug policy. This could be due to non revision of the NHIS essential drug list since it was first published in 2005 until 1st August 2013, which may had compelled prescribers to prescribe evidence based drugs that were not on the list in order to achieve desired outcomes for the patients. The revised NHIS essential drug list (second edition) was not implemented at all in the studied hospital in 2013.

The recorded highest prescription of anti-hypertensive drugs may indicate that hypertension had the highest disease burden at the health facility during the year under review. This finding is not in consonance with the finding of a previous study in the North east Nigeria [10].

4.3 Patient Care Indicators

The pharmacists' average prescription assessment time in NHIS was lower than in GOPD. This finding is not in line with a previous study at a tertiary public hospital, Lokoja which reported an average time of 48.2 seconds [8]. The pharmacists' billing time was high, this is evident that pharmacists spend more time billing than assessing prescriptions despite electronic billing method used at the facility. The shorter prescription assessment time obtained was not adequate for pharmacists' to identify drug therapy problems if present. The possible explanation may be a pharmacist's strategy to prevent patient overcrowding the pharmacy against quality of care.

The average revenue time recorded from this study was higher than the finding of a previous study that reported an average value of 2.6 minutes [8]. Patients spending great amount of time at the point of payment does not reflect appropriate time management in the health insurance scheme. This long revenue time increases the time a patient spend in the hospital which may lead to patients' dissatisfaction with the service rendered by the scheme. The long payment time recorded was as a result of manual documentation by cashiers despite the use of electronic payment method at the study area.

The time spent for medication counselling was far too short for any meaningful care to be rendered to patients by pharmacists. The average time of 15.6 second from this study is consistent with that of an Indian study which reported a much lower value of 13.8 seconds [15], but inconsistent with a previous Nigerian study which reported 77.9 seconds [8]. These reported values still fall below the WHO reference value of 180 seconds. The short time observed may be due to the pressure on the pharmacists to attend to patients as fast as possible in order to avoid congestion at the pharmacy. This finding is a confirmation that activities of pharmacists still revolves around the drug products instead of patients; even in this contemporary time that pharmaceutical care is globally re-engineering the pharmacy practice to patient centred practice.

The labelling of dispensed drugs was inadequate due to high number of medication packages without patient name. Patient's name is a vital component for labelling to be adequate. Patient's name on the medication packages is necessary, for example if there were a mix up of drug packages, the rightful owner will be identified by his/her name on the package. Patient's name on medication packages had saved many from taking drugs meant for another patients and the attendant risks. The finding of this study is consistent with the finding of an Indian study [16], but inconsistent with the finding of a Nigerian study and another Indian study which reported much higher values of 84.5% and 87.1% respectively [8,15].

Patients' knowledge of the correct dosage of the dispensed medications was not adequate. These findings have implications for patient care at the facility, particularly for outpatients who are responsible for the management of their medications. Poor patient knowledge of their medications has the potential to lead to medication non-adherence in addition to other medication misadventures. This finding is in line with that of previous Indian studies [15,16].

4.4 Applicability of the Study Findings

The findings of this study give a clearer picture of drug use practices in the health Insurance scheme of the studied hospitals. Therefore, having identified drug use problems, effective interventions can be designed to address the identified problems. Examples of such interventions are training and re-training of healthcare providers on rational drug use, and improved teaching of clinical pharmacology and rational drug use in the undergraduate curricula of medical and pharmacy schools in the country. It can also serve as a basis for periodic monitoring and supervision of drug use behaviours in the studied setting. On the other hand, it can be used to compare performance of drug use practices in the health insurance scheme of the studied hospital and other individual hospitals.

4.5 Study Limitations

The limitations of this study include inability to compare the drug prescribing indicators in NHIS and Non-NHIS due to unavailability of filled stored prescriptions at GOPD pharmacy unit, inability to evaluate patient's health outcomes because patient's medical case files were not used for the study, and for the fact that medication prescribing does not always represent actual drug use by the patient. It was a quantitative analysis and so qualitative appropriateness of prescriptions was not done.

5. CONCLUSION

There was high incidence of poly-pharmacy, over use of antibiotics, inadequate adherence to NHIS essential drug list and non-conformity to the generic prescribing. Antihypertensive drug class was the most prescribed among all drug classes. Pharmacists' prescription assessment and medication counselling did not depict quality care. Labelling of drugs was inadequate and majority of the patients did not have knowledge of correct dosage of their dispensed drugs.

CONSENT

All authors declare that written informed consent was obtained from the patients that participated in this study for publication of this paper.

ETHICAL APPROVAL

Ethical approval for this study was obtained from the Health Research Ethics Committee of the University of Nigeria Teaching Hospital, Ituku-Ozalla, Enugu state, Nigeria.

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COMPETING INTERESTS

Authors have declared that no competing interests exist.

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