

Original Research Article

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

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 prescribing patterns in the NHIS at a Tertiary Hospital in Nigeria.

Methods: Retrospective study of randomly sampled 1200 out-patient's NHIS prescriptions was carried out to evaluate the drug prescribing indicators. Prospectively, a conveniently sampled 120 patients each at General Out-patient Department (GOPD) clinic, NHIS, and GOPD dispensing pharmacy outlets were observed during consultations and interviewed before leaving pharmacy to assess the patient care indicators. Data were analyzed using descriptive statistics; Independent samples t-test and Chi square 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 ($P=.05$), whereas the average medication counselling time were 15.6 seconds and 34.7 seconds respectively with significant difference ($P=.05$). Dispensed drugs that were properly labelled were significantly higher in NHIS than in GOPD (62.0% vs 37.5%). Patient correct drug dosage knowledge was also significantly higher in NHIS than in GOPD (20.4 % 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.

Keywords: Drug use indicators, 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. Rational use of drugs in NHIS in the south eastern Nigeria has not been investigated, hence the need for this study. The objective of this study was to investigate prescription patterns, and drug use practices in NHIS in the setting studied.

2. MATERIAL 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, patients are compelled to purchase such drugs out-of-pocket from other dispensing pharmacy outlets of the hospital or 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 (2) pharmacy technician, one (1) pharmacy assistant, and one (1) clerk were working in this pharmacy outlet.

2.2 Study Design

Prospective and retrospective study designs were used in assessing the different indicators. Prospectively, convenient sampling was used to select 120 patients 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 the 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 consist 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 [5].

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,

80 waiting time was not included for physician's consultation time; the time between entering pharmacy
81 to collect drugs and leaving, waiting time was also not included for medication counselling time;
82 whether or not the drugs were actually dispensed at the pharmacy units; information on the number of
83 drug packages whether or not they contain at least patient name, drug name and when the drug
84 should be taken; data on the ability of patients to report the dosage schedule for all dispensed drugs
85 were recorded respectively.

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

88 **2.5 Outcome Measured**

89 WHO reference [6] was used to measure the following outcomes: (a) Average number of drugs per
90 encounter measured the degree of poly-pharmacy, (b) Percentage of drugs prescribed by generic
91 name measured tendency of prescribers to prescribe by generic name, (c) Percentage of encounters
92 with an antibiotic prescribed measured the overall level of overuse of antibiotics, (d) Percentage of
93 encounters with an injection prescribed measures the overall level of overuse of injections, (e)
94 Percentage of drugs prescribed from NHIS essential drug list measured the degree to which practices
95 conform to national health insurance policy, as indicated by prescribing from the NHIS essential drug
96 list, (f) Availability of copy of NHIS essential drug list indicates the extent to which copies of the
97 essential drug list are available at the health facility, (g) Average consultation time measured the
98 adequacy of consultation and prescribing, (h) Average counselling time measured the adequacy of
99 patients medication counselling, (i) Percentage of drugs actually dispensed measured the degree to
100 which the health facility is able to provide the drugs which were prescribed, (j) Percentage of
101 dispensed drugs adequately labelled measured the degree to which dispensers record essential
102 information on the drug packages dispensed, (k) Patient's knowledge of correct dosage measured the
103 effectiveness of the information given to patients on the dosage schedule of the drugs they received,
104 (l) Availability of key drugs measured the availability of key drugs recommended for the treatment of
105 some common health problems at the health facility.

106 **2.6 Data Analysis**

107 Data generated from the prepared data forms were analyzed using SPSS version 17 (Chicago, IL,
108 USA), after manual verification and cleaning. The values for the investigated indicators were
109 calculated as previously reported [6]. 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 and Pearson chi square (χ^2) test. A value for P = .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 (**Table1**).

Table1: 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**).

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

The frequency distribution of prescribed medications showed that anti-hypertensives, 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**).

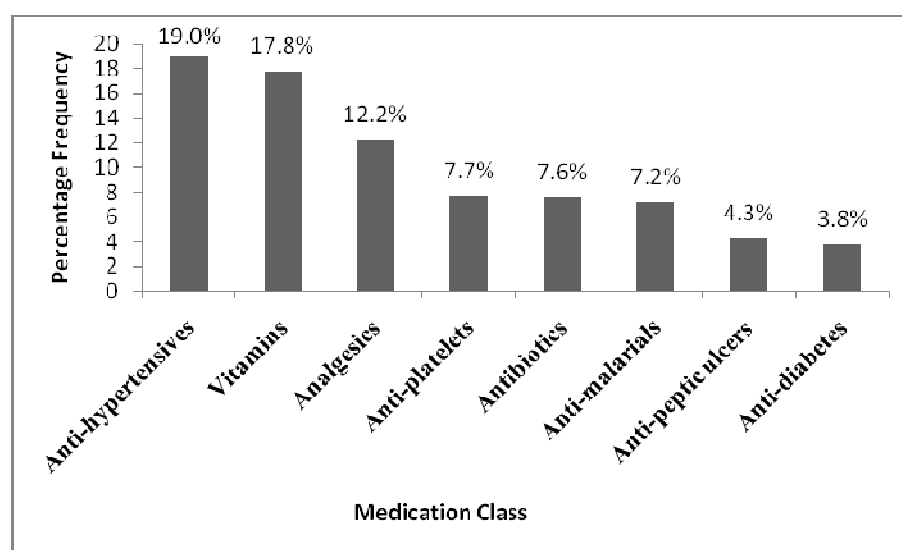


Figure 1: Frequency Distribution of the Most Commonly Prescribed Classes of Medications

With regard to the patient care, an average of 18.6 minutes was spent by the physician 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). Percentages of drugs actually dispensed were not significantly different among the two pharmacy outlets although, higher percentage was observed 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%) with significant difference. 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. Values of the patient's knowledge of correct dosage were 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 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	*
Average medicine billing time (seconds)	65.20±19.98	127.13±54.64	*
Average payment time (minutes)	5.70±1.73	1.83±1.18	*
Average counseling time (seconds)	15.61±9.08	34.72±26.84	*
Average doctor's consulting time (minutes)	-	18.61±8.84	
Drugs dispensed (%)	92.0	70.2	*
Drugs properly labeled (%)	62.0	20.4	*
Patients' knowledge of correct drug dosage (%)	37.5	23.3	-

Mean±Standard Deviation; *P = .05

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 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 [7]. The study finding is comparable to the value (3.95) got from a similar study in the same scheme in a different region in Nigeria [8]. 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 [9, 10] 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 was 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 show 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% [7], but consistent with a previous NHIS study in the north

eastern Nigeria that reported 56.2% [11]. The findings of these NHIS studies are in agreement with that of previous non-NHIS Nigerian studies that reported 51.1% and 43.8% respectively [9, 12] and inconsistent with an Indian study that reported a value of 14.9% outside the health insurance scheme [13]. 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.

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 [11] and inconsistent with the finding of 82.3% by another study outside the scheme [12]. The finding of this study revealed that the prescribing practices of the prescribers in the study area 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 study 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 eastern Nigeria [11].

4.2 Patient Care Indicators

The pharmacists' average prescription assessment time in NHIS was lower than in GOPD. This finding is not in line with that reported by a previous study at a tertiary public hospital, Lokoja which reported an average time of 48.2 seconds [12]. The pharmacists' billing time was high, this is evident that pharmacist spend more time billing than assessing prescriptions despite electronic billing method used. The shorter prescription assessment time obtained was not adequate for pharmacists' to

217 identify drug therapy problems if present. The possible explanation may be a pharmacist's strategy to
218 prevent patient overcrowding the pharmacy against quality of care.

219 The average revenue time recorded from this study was higher than the finding of a previous study
220 that reported an average value of 2.6 minutes [12]. Patients spending great amount of time at the
221 point of payment does not reflect appropriate time management in the health insurance scheme. This
222 long revenue time increases the time a patient spend in the hospital which may lead to patients'
223 dissatisfaction with the service rendered by the scheme. The long payment time recorded was as a
224 result of manual documentation by cashiers despite the use of electronic payment method at the
225 study area.

226 The time spent for medication counselling was far too short for any meaningful care to be rendered to
227 patients by pharmacists. The average time of 15.6 second from this study is consistent with that of an
228 Indian study which reported a much lower value of 13.8 seconds [13], but inconsistent with a previous
229 Nigerian study which reported 77.9 seconds [12]. These reported values still fall below the WHO
230 reference value of 180 seconds. The short time observed may be due to the pressure on the
231 pharmacists to attend to patients as fast as possible in order to avoid congestion at the pharmacy.
232 This finding is a confirmation that activities of pharmacists still revolves around the drug product
233 instead of patients; even in this contemporary time that pharmaceutical care is globally re-engineering
234 the pharmacy practice to patient centred practice.

235 The labelling of dispensed drugs was inadequate due to high number of medication packages without
236 patient name. Patient's name is a vital component for labelling to be adequate. Patient's name on the
237 medication packages is necessary, for example if there were a mix up of drug packages, the rightful
238 owner will be identified by his/her name on the package. Patient's name on medication packages had
239 saved many from taking drugs meant for another patients and their attendant risks. The finding of this
240 study is consistent with the finding of an Indian study [14], but inconsistent with the finding of a
241 Nigerian study and another Indian study which reported much higher values of 84.5% and 87.1%
242 respectively [12, 13].

243 Patients' knowledge of the correct dosage of the dispensed medications was not adequate. These
244 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 [13, 14].

4.3 Study Limitations

The limitations of this study include 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.

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 drug class. Pharmacists' prescription assessment and medication counselling did not depict quality care. Labelling of drugs was inadequate and majority of the patients do not have knowledge of correct dosage of their dispensed drugs.

ETHICAL APPROVAL

Ethical approval for this study was obtained from the ethical and research Committee of the University of Nigeria Teaching Hospital, Ituku-Ozalla, Enugu state, Nigeria.

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