

Drug use pattern with standard indicators in Jos University Teaching Hospital Nigeria

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ABSTRACT

Background: Drug use pattern is assessed through prescribers, dispensers, and patients. The indicators used for monitoring include, health-facility, prescribing and patient care indicators.

Objectives: The study was aimed at determining the drug use pattern by measuring core indicators in Jos University Teaching Hospital (JUTH), Nigeria, from 2010 to 2011, and to compare findings with similar institutions globally.

Methods: Drug-specific analysis employed research tools using nine-item questionnaires, checklists and standard patient care forms. Data was obtained from patients who visited the hospital, within the period of this study.

Results: The study revealed that out of the total drugs prescribed, 85.3% were dispensed and the average number of drugs per prescription was three. About 70.2% of drugs were prescribed by generic names while the rest were by brand names. Drugs prescribed from the hospital formulary were 88% with antibiotics being the most prescribed (35.3%) while the least prescribed were injections (9%) with no significant variation ($p > 0.05$) for the indicators measured during the period. Responses to questions on drug use produced positive results (>85%) in six out of the nine research items. Average consultation time was 11.33 minutes and dispensing time gave 3.53 minutes.

Conclusion: The drug use pattern in JUTH was satisfactory compared to national and international findings. The core indicators measured underscored the need for pharmacists to provide drug information and counseling needs to patients and could serve as basis for further studies on drug use for hospitals in resource limited settings.

Key words: Drug use, Standard indicators, Pharmacists

INTRODUCTION

There are core indicators for measuring the extent of rational drug use. Drug use patterns are assessed through prescribers, dispensers, and patients. The indicators used for monitoring drug use include, prescribing, patient care and health-facility indicators.¹ Core drug use indicators serve as a simple method of monitoring drug use in a standardized way.² At the prescriber level, rational drug use brings about an improvement in patient health and quality of life. Studies carried out by Chedi.³ showed that the average consultation and dispensing time among the

studied health institutions were within the range of 2.3 to 4.2 minutes and 24 to 36 seconds respectively. A high number of drugs prescribed conformed to National Essential Drugs List and were dispensed (90-96%) by the Hospitals Pharmacies. Most patients (80-95%) knew the correct dosages, but none of the dispensed drugs was adequately labeled. The availability of key drugs was 84% to 87%.

Drug use indicators measure the performance of health care providers in several key dimensions related to the

appropriate use of drugs. A proper evaluation of the quality care should also access the content of interactions between patients' and health workers. However, this is both practically and technically beyond the scope of a limited set of core indicators. It is necessary, therefore, to examine the health provider-patient interactions in more detail and to explore the beliefs and motivations regarding the use of drug in-depth after an initial survey has identified one or more specific problems.

The study was aimed at measuring core indicators in Jos University Teaching Hospital (JUTH), Nigeria, from 2010 to 2011, and to compare findings with similar institutions locally and internationally.

The research will enable detailed measures to be assessed for this tertiary health institution. These will include;

Prescribing Indicators

- a. To measure the average number of drugs per encounter.
- b. To calculate the percentage of drugs prescribed by generic name.
- a. To calculate the percentage of encounters with an antibiotic prescribed.
- b. To calculate the percentage of encounters with an injection prescribed.
- c. To calculate the percentage of drugs prescribed from essential drugs list or formulary.

Patient Care Indicators

- d. To determine average consultation time
- e. To determine average dispensing time
- f. To measure percentage of drugs actually dispensed
- g. To measure percentage of drugs adequately labeled
- h. To measure Patients' knowledge of correct dosage

Health Facility Indicators

- i. To determine availability of Essential drug list or Hospital drug formulary
- j. To determine availability of key drugs

METHODS

Drug-specific analysis employed research tools using nine-item questionnaires, checklists and standard patient care forms. Data was obtained by face to face interview and prescription orders only from patients who visited the hospital pharmacy, within the period of this study.

A cross-sectional prospective study was carried out to assess the level of drug use in tertiary health

institutions. The study was conducted in the Jos University Teaching Hospital (JUTH), Plateau State, Nigeria. The period of study was from (March, 2010 - June, 2011) using the World Health Organization (WHO) recommended standard drug use indicators.

The target population of the study consisted of volunteered ambulatory patients who obtained prescriptions from the Physician and also visited the hospital pharmacy during the time of this study as well as patients whose prescription sheets were handled or dispensed by the hospital pharmacy during the research. Approval was given by the institutional health research and ethics committee of the hospital before the research was carried out.

Sampling and Sample Size

Prescriber Indicator study:

For this study, 600 prescription sheets, one-third of the average monthly sample frame of patient turnout, were analyzed by adopting the systematic random sampling (one out of every other prescription sheet encountered was included) for period under the study.

Patient Care Indicator study:

Data on 300 outpatients were collected from the hospital by systematic random sampling (one out of every other prescription sheet encountered was included) for period under the study.

Health Facility Indicator study:

Sample size was obtained from the average monthly sample frame (1520) of patient turnout, and one-third of the average number (460) patients that visited the outpatient pharmacy in a month was estimated and used as the sample size. A checklist was used to compute for availability of 'key drugs' in the hospital facility adopting the method recommended by WHO and used by Chedi.³

Data Analysis

Data for the encounters surveyed for each subgroup were collected for the indicators mentioned above and were analyzed for the Student's t-test using statistical package for the social sciences (SPSS Version 16.0, 2007, USA) and one-way analysis of variance was performed for variables measured at 5% level of significance.

RESULTS

The results of studies shown in Table 1 reveal the summary of prescribing indicators measured. Table 2 showed a summary of the patient care indicators assessed for both consultation and dispensing time. Table 3 was responses to questions administered via

questionnaires to patients in Jos University Teaching Hospital (JUTH). Table 4 was the responses of patients' impression on drug use. Table 5 showed a distribution

of key oral antibiotics classes identified in JUTH.

Table 1: Summary of Prescribing Indicators Monitored (n=600)

Month	Ave. No. of Drugs	% of Generic	% of Antibiotics	% of Injections	% on EDL
January	3.18 ± 0.13	74.43 ± 2.00	39.18 ± 9.57	5.85 ± 0.85	88.90 ± 1.92
February	3.00 ± 0.10	62.00 ± 14.00	39.65 ± 3.65	1.65 ± 1.65	83.60 ± 6.60
March	2.93 ± 0.05	73.15 ± 5.62	10.75 ± 2.84	6.57 ± 2.29	88.53 ± 3.67
April	2.87 ± 0.29	68.97 ± 3.22	42.23 ± 22.29	20.00 ± 8.40	90.10 ± 1.59
May	2.87 ± 0.15	68.43 ± 3.40	43.33 ± 10.70	8.87 ± 5.57	88.73 ± 4.92
June	3.23 ± 0.29	69.40 ± 6.60	42.50 ± 7.73	10.00 ± 5.94	85.63 ± 6.50
Average	3.03 ± 0.08	70.21 ± 2.13	35.29 ± 4.77	8.98 ± 2.08	87.80 ± 1.65

Analysis of variance for all categories of indicators yielded $p > 0.05$ for variations within each group.

% - Percentage; No.- Number; Ave. No. of Drugs - Average number of drugs prescribed.

Total drugs prescribed =1819; 85.3% were dispensed and the average number of drugs.

Table 2: Patient care Form showing a Summary of the Indicators Assessed

Seq.	Consultation time (min)	Dispensing time (sec)	Drugs Prescribed	Drugs dispensed	Drugs adequately labeled	Knowledge of dosage (Yes/No)
N	120	300	300	300	300	100
Total	1360	63661.5	934	797	720	93
Average (\bar{x})	11.33±0.45	212.205±6.9	3.1±0.08	2.65±0.067	2.8±0.073	9.3±0.01
Percentage Measure	-	-	-	85.3% of prescribed	90.4% of dispensed	93% of cases asked

Table 3: Response rate to Questions Administered via Questionnaires to patients in JUTH (n=460)

Research items	Yes		No	
	n	Percentage (%)	n	Percentage (%)
Did the doctor tell you about your drugs?	118	25.65*	342	74.35
Did the pharmacist tell you about your drugs?	394	85.65	66	14.35
Did the pharmacist tell you how to take your drugs?	460	100	0	0
Did you understand what the pharmacist told you about your drugs?	438	95.22	22	4.78
Were your drugs labeled by the pharmacist?	448	97.39	12	2.61
Do you know why you are taking these tablets?	414	90	46	10
Do you know about the possible side effects?	92	20*	368	80
Do you know how to take your drugs correctly?	448	97.39	12	2.61
Do you know why you must finish your dose?	206	44.78*	254	55.22

Footnote: Values in asterisk (*) fell below average from responses given

Table 4: Response of patients' impression on drug use (n=460)

Patients' Impression	Percentage (%)
Confident	29.41
Angry	13.73
Apprehensive	5.88
Timid	17.65
Troubled	7.84
Afraid	25.49
Total	100

Health Facility Indicators

In the Jos University Teaching Hospital (JUTH) study, availability of key drugs was 86.8%, using a checklist. There were also available copies of the Hospital's Formulary (2009) or the National Essential Drugs List (2010) in each pharmacy unit and in the consulting rooms.

Table 5: Distribution of Oral Antibiotics Classes Identified in JUTH (n=548)

Key Antimicrobial Drugs	n	Percentage (%)
Penicillins (β - Lactams)	183	33.39%
Quinolones	154	28.10%
Microlides	36	6.51%
Metronidazole	121	22.08%
Tetracyclines	39	7.12%
Chloramphenicol	3	0.25%
Anthelmintics	12	2.19%

DISCUSSION

The study carried out revealed that of the total drugs prescribed, 85.3% were dispensed and the average number of drugs per prescription was three. The average number of drugs per prescription when compared to those of the World Health Organization⁴ with a range of (1.3 to 2.2 number of drugs per prescription), indicated that the average value for Jos University Teaching Hospital (JUTH), Nigeria, was high, hence, the practice of polypharmacy could be possible but not deductive. In Yemen,⁴ the average number of drugs prescribed was 1.4; however, a number of factors could skew the results on number of drugs prescribed, such as epidemiological pattern of diseases, disease incidence or prevalence, access to essential drugs and the economic power of a nation.⁴ The prescriptions considered in this research for the period under consideration were for patients

diagnosed for co-morbidities.

About 70.2% of drugs were prescribed by generic names while the rest were by brand names. The level of compliance to generic naming^{1,4} when compared with the range of 82-94%^{1,4} showed that generic prescribing was lower as several drug prescriptions contained branded names. The 2005 National Drug Policy for Nigeria promotes generic prescribing; therefore, 29.8% of branded drugs could be attributed to the marketing influence of drug companies and their medical representatives.⁵

Drugs prescribed were 88% from the hospital formulary with antibiotics being the most prescribed (35.3%) while the least prescribed were injections (9%) with no significant variation ($p > 0.05$) for the indicators measured during the study period. In Kano, Nigeria, a high number of drugs prescribed conformed to National Essential Drugs List and were dispensed (90-

96%) by the hospitals' pharmacies.³

Drug use in Sub-Saharan Africa had always recorded high outputs in previous researches like those carried out by Chedi.³ In Nigeria, the upsurge in antibiotic-resistant case has aided health authorities in deciding to control the multiple uses of antibiotics from syndromic management to clinical based management. Average consultation time measured was 11.33 minutes and dispensing time gave 3.53 minutes. Similar studies carried out in another part of the country revealed that the average consultation was considered as good, within the range of 2.3 to 4.2 minutes and average dispensing time, within 24 to 36 seconds, was considered as poor. The dispensing time obtained in this study was considered short for proper medication counseling. According to WHO and the classification of *Tribunal de Contas da União* in Brazil,⁶ appointment durations between 11.4 and 15.0 minutes were considered as excellent; 7.6 - 11.3 minutes as good; 3.8 - 7.5 minutes as regular and 0.1 - 3.7 minutes as poor.⁶ Responses to questions on drug use produced positive results (>85%) in six out of the nine research items while 20% had sound knowledge of the possible side effects and only 44.8% understood why they had to complete their medication. In JUTH, 93% knew the correct dosages and 90.4% the dispensed drugs were adequately labeled, unlike results from Cambodia where a single dispensed drug was not adequately labeled in the hospitals assessed.⁷ In Kano, Nigeria, most patients (80-95%) knew the correct dosages, but none of the dispensed drugs was adequately labeled.³ The patient care assessment underscored the need for pharmacists' role in directly providing drug information and counseling needs to patients.

There was one available copy of the Hospital's formulary (2008) or the National Essential Drug Formulary (2010) in each pharmacy unit and in consulting rooms; however, the use of information from drug bulletins and reference materials would require continuous improvement of skills on the part of health personnel.

The impression of respondents towards drug use shown in Table 4 was studied to investigate possible confounders to drug use practices. From the results, 29.4% of patients were confident in the rational drug use process giving their responses a high degree of acceptability. However, 13.7% of them were angry with delays in processes required to obtain services linked with rational use. Moreover, 5.8% of the respondents were apprehensive whenever they visited clinics due to cumbersome tasks and queues;

the rational drug use process had created. Also, 17.6% and 7.8% were reported to be, in the presence of healthcare providers, timid and troubled, respectively. These impressions would likely limit the factual expression of respondents' opinion. As many as, 25.4% responded to be afraid of answering questions posed at them during interviews and counseling sessions by health professionals, not knowing what the consequences of the answers could result into. The fear of these patients was not clear cut but had to be captured instead of regrouping them into timidity, apprehension and troubled categories. These various impressions expressed by the patients could have produced some false-positive or -negative responses. Therefore, patients' responses are likely to be more accurate when juxtaposed with their impressions on rational drug use and health.

A quantitative representation of the key antimicrobial agents prescribed to a group of sampled patients during the study. The availability of key drugs was above 86% in JUTH; in Kano, Nigeria, the availability of key drugs was within 84% to 87%. The key drugs were a true representation of the variety of antimicrobial agents specified for the control of infections in this part of the world, and were similar to key drugs used in other parts of Nigeria and Africa.

Limitations of the Study

The cross-sectional study was carried out on one health facility. The results would, therefore, be subject to meta-analysis with similar findings from other Nigerian studies before extrapolations can be made for general populations.

Patients' impressions about the service rendered or the health facility studied could have produced some false-positive or -negative responses.

CONCLUSION

The drug use pattern in JUTH was satisfactory when compared with works from global findings but underscored the need for pharmacists to provide drug information and counseling needs to patients which could serve as basis for further studies on drug use patterns and challenges for hospitals in resource limited settings. The results of this study will guide management in proffering definite decisions and intervening measures to improve on the quality of prescribing, dispensing, patients' quality of life and patient care.

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