

Assessment of Patient-care and Facility-specific Indicators in Government-owned Secondary Healthcare Facilities in Ogun State, Nigeria

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ABSTRACT

Background: Drugs are used for prevention, treatment or diagnosis of diseases. Rational drug use is imperative to achieve optimal outcome. Patient-centered treatment is crucial to achieving therapy goals and acceptable healthcare facilities ensure the right environment for practice. This study assessed Patient-care and Facility-specific indicators in Government-owned Secondary Healthcare Facilities in Ogun State.

Methods: The study was a prospective evaluation of the performance of the three selected healthcare facilities in area of patient-care and facility-specifics in accordance with the WHO/INRUD drug use indicators. Six hundred patients were interviewed comprising 200 patients per centre. The data obtained was analyzed with descriptive statistics such as frequency and percentages using SPSS version 20 with the level of significance set at < 0.05 .

Results: The total number of patients interviewed at the three study centers for the patient-care indicators were six hundred (200 at each facility) and eighty three (41.5%) were males. The mean age was 43.3 ± 16.5 ; average consultation time was 4.3 ± 1.9 minutes while the average dispensing time was 20.4 ± 7.3 seconds. The percentages of the prescribed drugs actually dispensed and drugs adequately labeled were 98.5 ± 6.7 and 97.3 ± 15.13 respectively. The percentage availability of Essential Medicines List (EML) copy was 100 ± 0.0 and the percent key drugs in stock at the time of study was 88.3 ± 10.4 .

Conclusion: This study concluded that the healthcare performance at the study centres in relation to patient-care and facility-specifics was suboptimal and less than that stipulated by the WHO. It fell short of the expected standard practice thereby confirming irrational drug use. Regular training of healthcare professionals is hereby recommended to improve healthcare outcome.

Introduction

Focusing healthcare services on patient rather than the medication has been found to be a great step forward towards rational drug use and profitable healthcare outcomes^{1,2}. Rational drug use ensures that the right medication is given to the right patient at the right dosage for the adequate length of time with cost effectiveness^{2,3}. Patients should therefore be considered individually in relation to medication use especially due to individual peculiarity. Both healthcare professionals and patients are

involved in irrational drug use at various stages. Physicians, pharmacists, nurses, laboratory scientists and other healthcare professionals contribute to irrational drug use at the stages of diagnosis, selection, prescription, counselling and administration. Patients on the other hand are involved in self-medication, use for wrong indication and incorrect use^{3,4}. Inappropriate use of drugs may therefore occur as irrational prescribing, dispensing and consumption⁴. Consequences of irrational drug use include: extended duration of illness, loss of cost effective treatment as well as

increase morbidity and mortality especially in chronic diseases such as hypertension, diabetes, epilepsy and neurological disorders^{1,5}. The upsurge in antibacterial resistance has also been linked to irrational antibacterial use³. Continuous assessment of healthcare performance to ensure conformity with standard practice is therefore essential. The WHO- developed patient-care indicators are a set of five indicators that assess patients' care in a facility. Each has an optimal value expected to guide professional-patient care activities. These include: average consultation time in minutes, average dispensing time in seconds, percent drugs actually dispensed, percent drugs adequately labeled and percent patients with knowledge of correct doses^{2, 3, 5}. The indicator recommended that: the optimal value for the average consultation time is ≥ 10 minutes. This is the time it takes a physician to communicate, examine a patient and make reasonable diagnosis of the patient's condition leading to the prescription of appropriate drugs for the patient^{1,2,5}.

The dispensing time is the time it takes the dispensing pharmacist to make the prescribed drugs available to the patient and give necessary information to allow the patient has adequate knowledge of the correct use of the drug(s) dispensed. The optimal value of dispensing time as set by WHO drug use indicator is ≥ 90 s⁵. The patient should be adequately counselled so as to derive maximum benefits from the drug².

Percent drugs actually dispensed have an optimum value of 100. This is the proportion of drugs dispensed in relation to the prescribed drugs expressed as a percentage. Labeling is the supply of relevant drug information in written form that identifies the patient with his drug, instructs and reminds him of how to take the drug appropriately, even after departing from the dispenser^{2,6}. According to WHO-drug use recommendation, drugs properly labeled should include: patient's name, name of drug, strength, duration and dosage which comprise dose and frequency of usage⁶. The pharmacist is expected to label the drugs appropriately in such a way to allow patient's comprehension. The WHO recommends 100% of all drugs to be adequately labeled. Percent patients with knowledge of correct doses are another indicator^{1,2,6}. This is a measure of the proportion of patients that have the correct knowledge of doses of drugs prescribed and dispensed to them. The optimal value is 100, signifying that the core drug indicators expect all patients to have correct knowledge of the dosage of their drugs^{1, 5}. Pharmacists are expected to give appropriate counsel to patients to enable them have correct knowledge of their drugs usage.

Facility-specific indicators are the last sets of indicators advanced by the WHO to assess rational drug use. They

comprised availability of Essential Medicine list (EML) or formulary to practitioners and percent key drugs available^{2, 3,5}. The EML or formulary contains drugs that are essential to the health need of the community. The WHO recommends the use of EML for effective and safe health delivery^{2, 3}. The optimum value of availability of EML is 100%. Availability and prescription from EML is therefore expected to be total in accordance with the WHO core-drug use indicators^{2, 3}. Essential drugs satisfy the preference of health-care needs of the population and should be obtainable all times. According to WHO recommendation, at least 15 essential drugs should be chosen in each healthcare facility. These are termed key-drugs and they are expected to be available at the pharmacy all the time. Such drugs are selected based on management of diseases prevalent in the community where the facility is located. The optimum value is 100^{2,3,5}.

These sets of indicators have been found useful in determining patient-care and facility-specific performance of healthcare facilities. There is the scarcity of studies assessing these two parameters in the Ogun state secondary healthcare facilities. The present studies therefore assessed the patient-care and facility-specific performance of Ogun state government-owned secondary healthcare facilities. Patient-care and facility specifics are dynamic and are expected to be improved upon from time to time to meet with the challenge of healthcare needs and keep with the standard of new discoveries. Continuous assessment of healthcare performance indicators is therefore imperative to monitor the extent of conformity with standard practice. Hence the need for the present study.

Materials and Methods

Study settings

The study was carried out in Ogun State of Nigeria which comprised three senatorial districts. One Government-owned Secondary Healthcare Facility with the highest outpatient attendance was selected per district. It was a prospective evaluation of the performance of the three selected healthcare facilities in area of patient-care and facility-specifics in accordance with the WHO/INRUD drug use indicators. At the time of the study, State Hospital Abeokuta having patients' attendance of 1600, State Hospital Ijebu Ode with patients' attendance of 1157 and State Hospital Ota with patients' attendance of 1151 per quarter were selected. A total of 600 patients were interviewed comprising of 200 patients per facility.

Ethical Approval

Approval for the study was given by the University of

Ibadan/University College Hospital (UI/UCH) Health Research and Ethics Committee with reference number (UI/EC/15/038). The pharmacy department of Ogun State Health Management Board also permitted the study with reference number (SHB/2146/DPS/201).

Inclusion and Exclusion Criteria

Patients that were 18 years and above at the time of study that voluntarily consented to participate in the study were included irrespective of whether they are first timer or not while those below 18 years and those who did not consent were excluded. Patients who require laboratory examinations were also excluded.

Study Design

The study was a prospective evaluation of the performance of the three selected healthcare facilities in area of patient-care and facility-specifics in accordance with the WHO/INRUD drug use indicators^{7,8}.

Sample Size Determination and Sampling Technique

In assessing patient-care performance, WHO recommended at least 100 outpatient attendants (encounters) as the sample size in individual health facility⁹. For the evaluation of patient-care indicators, a total of 600 outpatients comprising 200 outpatients per facility were selected by convenient sampling.

For the facility-specific indicators, twenty key drugs from each healthcare facility were selected to keep within the WHO recommendation of at least 15 essential drugs in each health facility⁸. The drugs were selected in collaboration with the pharmacists in charge of the OPD pharmacies at the selected sites. Thirty of drugs that are frequently prescribed in each facility were suggested by the pharmacists. From these, twenty that were common to the three facilities were selected to maintain uniformity.

Collection Instrument

Data was collected through the use of an observational check list developed by the investigators for patient-care and health facility-specific indicators in conformity with the WHO/INRUD drug use indicators. Data was collected by the investigator and two trained data collectors who were also pharmacists within the working hours of 7.30 am and 3.30pm Monday to Friday at the study sites. Current patient prescription sheets were used to assess patients' knowledge of prescribed drugs' correct dosage. Stop watch was used to determine the consultation and dispensing time with respect to each patient. The data were collected between March and May 2020.

Procedure for Data collection

Patients that visited the outpatients' department for medical consultation and treatment of general health conditions were approached for participation. Details of the study were explained. Those that gave consent to take part in the study and were 18 years and above were included in the study until the target sample was obtained. A combination of observation and oral interview were used to gather information being guided by the check list. The oral interview comprised questions to determine each patient's knowledge of the correct doses, duration of therapy and the frequency of dosing. Pharmacists that were in charge of dispensing of drugs and counselling of patients at the outpatient pharmacy of each healthcare facility were approached and they all consented and were interviewed to obtain required information and data were collected with the aid of a check list. The consultation time was obtained by one of the pharmacists trained for the purpose at the OPD consultation rooms. The stop watch starts from the time the patient was called in to the physicians to the time the patient emerges with a written prescription. The pharmacist then approached the patient and briefed him on the purpose of the study. The prescription sheet of those that consented were coded so as to be matched with the same code at the pharmacy where drugs are dispensed by pharmacists on duty and the patient counselled. The dispensing time was determined by the investigator who identified patients with coded prescription and follow up from the time the patient prescription was attended to at the pharmacy until the pharmacists completed counselling of the patient. A stop watch was also used at this point. The investigator then interviewed the patient to determine his knowledge of the dispensed drugs. Percentage number of patients with correct knowledge was determined by those having the correct knowledge of the dosage, duration, frequency and time of use. Percent of adequately labeled was obtained by number of dispensed drugs having complete information such as name of patient, name of drug, number/ amount dispensed, quantity to be taken, frequency and duration of use.

Processing and Analysis of Data

Data was collected manually and entered into a checklist (form) designed by the investigator and recorded in to spread sheet. The data were then entered into the Statistical Package for Social Science version 20 (IBM SPSS- 20). Description of the data was achieved using descriptive statistics such as frequencies, percentages, means and standard deviation. Differences among healthcare facilities were established using analysis of variance (ANOVA) with statistical significance level set at $p < 0.05$.

Furthermore, Zhang and Zhi index system for the comprehensive evaluation of healthcare system was employed for the appraisal of the data^{9,10}. Using this system, index of EML, consultation time, dispensing time, actually dispensed drugs, labeling of drugs, EML availability and key drugs available in stock were calculated using the formula:

Index = Observed value ÷ Optimal value.

The optimal index for all indicators was set at 1. The closer the value is to 1 the more rational the drug use system. The Index of Rational Healthcare Performance (IRHP) is the sum of all of index values of all Patient-care and facility-specific^{9,10}.

IRHP = IRPCDU + IRFSDU

Where IRHP = index of rational healthcare performance

IRPCDU = index of rational patient care drug use

IRFSDU = index of rational facility specific drug use

The healthcare facilities were ranked from 1 to 3 based on the IRHP values. The highest IRHP was ranked 1 while the lowest was ranked 3. Similarly, the healthcare facility with the highest IRHP value was considered best performing in term of rational healthcare performance¹⁰.

Results

Demographic Characteristics of Patients According to Sites for the Patient-care Indicators

The total number of patients interviewed at the three study centres for the patient-care indicators were six hundred (200 at each site). Eighty three (41.5%) were males. The mean age was 43.3 ± 16.5 (Table 1)

Patient-care Indicators

The average consultation time was 4.3 ± 1.9 minutes while the average dispensing time was 20.4 ± 7.3 seconds. The percentages of the prescribed drugs actually dispensed and drugs adequately labeled were 98.5 ± 6.7 and 97.3 ± 15.13 respectively. Percentage of the patients with knowledge of correct doses was 87.3 ± 33.3 . There were significant differences between all the patient-care indicators at the sites, $p < 0.001$ except for percentage of drugs actually dispensed and the percentage of patients with knowledge of correct doses (Table 2).

Facility-specific Indicators

The percentage availability of EML copy was 100 ± 0.0 and the percent key drugs in stock at the time of study was 88.3 ± 10.4 . There was significant difference in the key drugs in stock at the sites $p < 0.001$ (Table 2). All the obtained values of the performance indicators were lesser than the recommended optimal except the availability of EML (Table 3). The details of key drugs in stock common to all the three facilities are shown in Table 4.

Table 1: Demographic Characteristics of Patients for Patient-Care Indicators According to Sites (N = 200)

Age (Years)	SH Abeokuta N (%)	SH Ijebu Ode N (%)	SH Ota N (%)
0 – 20	8 9 (4.0)	10 (5.0)	9 (4.5)
21 -40	88 (44.0)	81 (40.5)	86 (43.0)
41 – 60	69 (34.5)	77 (38.5)	69 (34.5)
61 -81	30 (15.0)	29 (14.5)	30 (15.0)
>80	5 (2.5)	3 (1.5)	6 (3.0)
Mean Age	44.1 ± 16.0	43.1 ± 15.6	43.3 ± 16.5
Gender:			
Male	75 (37.5)	73 (36.5)	83 (41.5)
Female	125 (62.5)	127 (63.5)	117 (58.5)

SH = State Hospital

Table 2: WHO/INRUD Patient-care and Facility-specific Indicators in the Selected Secondary Healthcare Centres (N = 200)

Patient-care Indicators			SH Abeokuta	SH Ijebu Ode	SH Ota	Mean $\pm$ SD	ANOVA
Average consultation time (minutes)			5.5 $\pm$ 1.6	3.6 $\pm$ 1.1	3.9 $\pm$ 2.1	4.3 $\pm$ 1.9	P < 0.001
Average dispensing time (seconds)			23.7 $\pm$ 8.1	18.3 $\pm$ 5.9	19.1 $\pm$ 6.6	20.4 $\pm$ 7.3	P < 0.001
Percent drugs actually dispensed			97.8	98.9	98.9	98.5 $\pm$ 6.7	P = 0.15
Percent drugs adequately labeled			92.2	99.7	99.8	97.3 $\pm$ 15.13	P < 0.001
Percent patients with knowledge of correct doses			83.5	88.0	90.5	87.3 $\pm$ 33.3	P = 0.09
Facility-specific Indicators							
Availability of EML to practitioners			100.0	100.0	100.0	100.0	*
Percent key drugs available			100.0	85.0	80.0	88.3 $\pm$ 10.4	P < 0.001

SH = State hospital, ANOVA = Analysis of Variance, EML= Essential Medicines List * ANOVA not applied since there was no variation in values.

Table: 3 Comparison of Patient-care and Facility-specific Indicators in the Selected Secondary Healthcare Centres with the WHO/INRUD

Core drug use indicators	Optimal values	Mean obtained values
Patient-care indicators		
Average consultation time (minutes)	≥ 10	4.3 $\pm$ 1.9
Average dispensing time (seconds)	≥ 90	20.4 $\pm$ 7.3
Percent medicines actually dispensed	100	98.5 $\pm$ 6.7
Percent medicines adequately labeled	100	97.3 $\pm$ 15.13
Percent patients with knowledge of correct doses	100	87.3 $\pm$ 33.3
Facility-specific indicators		
Availability of essential medicines list (EML) or formulary to practitioners	100	100
Percent key medicines available	100	88.3 $\pm$ 10.4

WHO = World Health Organization, INRUD = International Network for Rational use of drugs

Table 4: Key Drug in Use Common to all the Selected Sites

Name and Dosage forms of Drugs	Class of Drugs	Strength Available
Amlodipine tablet	Antihypertensive	5 mg, 10 mg
Amoxicillin + clavulanic acid	Antibacterial agent	625 mg
Amoxicillin tablet, suspension	Antibacterial agent	500 mg, 125 mg/5ml
Artemether + Lumefantrine tablet	Anti-malaria	80/480 mg
Azithromycin tablet	Antibacterial agent	500 mg
Ceftriaxone IM, IV	Antibacterial agent	1000 mg
Cefuroxime tablet and suspension	Antibacterial agent	250 mg, 500 mg
Ciprofloxacin tablet	Antibacterial agent	500 mg
Co-trimoxazole tablet	Antibacterial agent	480 mg
Diclofenac tablet	Anti-inflammatory	50 mg
Doxycycline capsule	Antibacterial agent	100 mg
Furosemide tablet and injection	Diuretic	40 mg, 10 mg/ml
Hydralazine injection	Antihypertensive	20 mg/ml
Hydrocortisone injection	Anti-inflammatory agent	100 mg
Metformin tablet	Hypoglycemic agent	500 mg
Metronidazole tablet	Antibacterial agent	200 mg, 500 mg
Nitrazepam tablet	Hypnotic	1.5 mg, 3 mg
Omeprazole tablet and injection	PPI	20 mg
Oxytocin injection	Oxytocic	10 i u/ml
Paracetamol tablet, syrup and injection	Analgesic/antipyretic	500 mg, 125 mg/5ml

IM = intra muscular, IV = intra venous, PPI = proton pump inhibitor, i u = international unit, ml = milliliter, mg = milligram

Table 5: Performance Indicators for the Selected Secondary Healthcare Centres

Performance Indicators	SH Abeokuta	SH Ijebu Ode	SH Ota
Patient-Care Indicators			
Consultation time index	0.55	0.36	0.43
Dispensing time index	0.26	0.20	0.21
Dispensed drug index	0.98	0.99	0.99
Labeled drugs index	0.92	0.99	0.97
Patients' knowledge index	0.84	0.88	0.91
IRPCDU	3.55	3.42	3.51
Rank	1	3	2
Facility-Specific Indicators			
Index of EML	1.00	1.00	1.00
Index of Key drugs in stock	1.00	0.89	0.88
IRFSDU	2.00	1.89	1.88
Rank	1	2	3
Grand total			
IRHP	5.55	5.31	5.39
Rank	1	3	2

EML = Essential Medicines List, IRDP =, IRPCDU = Index of Rational Patient-Care Drug Use, IRFSDU = Index of Rational Facility-Specific Drug Use, IRHCP = Index of Rational Healthcare Performance.

Discussion

The average consultation time obtained from this study is lower than the WHO recommended standard as seen in previous studies^{12,13,14}. Another study however reported higher value than that obtained in this study¹⁴.

The contact time between professionals and the patients may likely influence the quality of the outcome of services rendered by the professionals. With adequate time, the professionals are likely to have enough opportunity to perform their responsibilities with qualitative outcome. Shorter contact time on the other hand may deprive the patient of necessary attention. Short consultation time may be due to high work load on the physicians. In Nigeria, the ratio of physicians to patients is said to be 1 to every 9,000 to 10,000 people. This is far short of the WHO recommendation of 1 to 600 people. The quality of diagnosis and appropriate treatment is likely to be limited by short consultation time. The patient has limited time to express himself and ask pertinent questions about the treatment. The healthcare management should therefore consider how to reduce work burden on physicians and thereby improve quality of consultation. The physicians should also improve on their commitment to patients' consultation for better outcomes.

The average dispensing time from this study was lower than the prescribed WHO specification which is similar to previous studies¹². However, in some studies values above the optimal were reported^{11,13,14}. Unsatisfactory information could lead to patient non-compliance with attendant non-realization of goal of therapy. Adequate dispensing time affords the counselling pharmacist the opportunity to pass sufficient information to the patient and also verify the patient's comprehension. The patients are likely to feel relaxed and secured to express their mind and understanding is likely to be enhanced in such setting. Short dispensing time may not be sufficient to provide adequate information on drug regimen to patients, hence, patients are likely to be deprived of the prospects to clear their doubts.^{15,16}

The actually dispensed drugs from the present study are a bit lower than the optimal value set by the WHO. Some studies reported similar lower values than the optimal^{11,12,13,14}. The central medical stores system being practiced in Ogun state of Nigeria where the present study was carried out, affords the availability of most drugs on the essential list. This is likely to be the reason while the percentage of drugs actually dispensed was relatively high even though not up to the optimal. This could be a reflection of good supply system and proper stock management.

The percentage drugs adequately labeled from the current study was similar to other parameters, a bit lower than the

recommended optimal value. Some other studies also reported lower values^{11,12,13,14}. Information such as patient's name, drug name, drug dose and regimen are expected to be supplied in writing for a prescribed drug. Written information is meant to support verbal instruction. It last longer and can be referred to later even when verbal instruction might have been forgotten. It is likely to enhance patient's knowledge and improves compliance^{15,16}. Pharmacists should therefore ensure patients are counselled verbally and adequate information supplied on the label.

The percentage patients with knowledge of correct doses is lower than the WHO recommended value. Similar lower values were reported by other researchers^{11,12}. Patient's knowledge of the correct drug use is central to rational drug use¹⁸. Pharmacists should therefore ensure that patients are well counselled so as to achieve the desired therapeutic outcome.

This study confirmed that all the healthcare facilities studied had Essential Medicines List (EML/formulary) available to practitioners. This is in conformity with the WHO recommended standard. This is similar to some other studies^{12,14} such as in Uganda and Indonesia^{13,15}. The EML and hospital formulary are essential for effective healthcare delivery. It is a proper instrument in the healthcare delivery system prioritizing efficacy, safety and cost effectiveness^{15,17}.

Percent key drugs available in stock as at the time of study was below the optimal. It was however discovered that all the key drugs were available in one of the centers which happened to be the state capital. The State Health Management Board operates central procurement system with central stores located at Abeokuta, the state capital. The proximity of the hospital in Abeokuta to the store might be responsible for the availability of all the key drugs at the centre. Some other studies also reported lower percent key drugs in stock than the optimal^{12,13}. It is important that limited range of drugs essential to the need of most patients around the healthcare facility coverage areas be carefully selected and availability ensured at all times. This is very important especially in resource-limited setting such as Nigeria.

Limitations of the Study

Patient's knowledge was assessed by dosage and frequency of drug administration in accordance with the WHO recommendation. However, there are other factors that are necessary to fully confirm patients' knowledge of drug use. A more complete evaluation should also consider patients' knowledge of potential adverse effects, drug-drug and drug-food interactions, storage requirements and other factors essential for the safe and appropriate use of medication.

Conclusion

The study confirmed deviation from rational healthcare practice. It was discovered that all the Patient-care Indicators were below the recommended WHO standard thereby confirming suboptimal drug use pattern. It is however commendable that the EML/formulary was available in all the centres. The state hospital at Abeokuta, the state capital ranked first in the Patient-care, Facility-specific Indicators as well as in the overall healthcare performance out of the three facilities considered. There is the need to effects constant training of healthcare professionals especially physician and pharmacists for improved practices. Consultation time should be fairly long enough to allow for proper diagnosis while the dispensing time should be improved upon to permit adequate counselling and grants patients opportunity to express and clear doubts. Pharmacists should therefore ensure that patients are well counselled so as to achieve the desired therapeutic outcome.

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Competing Interests

No conflicting interest is declared by any of the authors.

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