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Medication prescribing practices of healthcare professionals in primary health centres in Niger State, Nigeria

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Abstract

The objective of this study was to assess medication prescribing practices of healthcare professionals in primary health centres in Niger State, Nigeria. The study was carried out across the three Senatorial Districts in the state, 1 Primary Healthcare Centre (PHC) per senatorial district (total, 3 PHCs). Drug prescribing patterns of healthcare workers, including medical officers, nurses, and community health officers were assessed. Data were analyzed using WHO's drug use indicators, including average number of drugs per encounter, percentage of (drugs prescribed by generic name, encounter with an antibiotic prescribed, encounter with injection prescribed, and drug prescribed from the state's essential drug list or formulary). A total of 1,440 encounters were reviewed, and the overall average number of drugs per encounter was 5.6 (range 1 to 12 drugs), and 73% of the overall encounters had between 4 and 7 prescribed drugs. 71% of the drugs were prescribed in generic names, while 82% were from the state essential drug list for primary healthcare centres. Antibiotics and injections were prescribed in 79% and 56% of encounter, respectively. Malaria/fever was the most frequently (56%) encountered medical condition, while the most frequently prescribed therapeutic class of drugs were antibiotics (24.7%), anti-malarial drugs (20.5%), analgesic/antipyretics (18.9%), vitamins/minerals (18.4%). Our study revealed inappropriate drug prescribing at the PHCs. We recommend interventions that would improve drug use practices at the primary care level; such interventions would positively impact on the quality of care received by patients at this level of healthcare.

Keywords: Healthcare professionals; Medication prescribing practices; Niger State; Primary healthcare; Rational use of drugs

INTRODUCTION

Medicines are important in improving human health and promoting wellbeing; however, in order to produce the desired effects, they should be safe, efficacious, and used rationally by both healthcare professionals and patients (Maniyar *et al.*, 2011). In order to objectively evaluate medication use practices by healthcare facilities, the World Health Organization developed a set of tools for assessing medication prescribing by healthcare professionals (WHO, 1993). These tools are important for audit, supervision, and monitoring of drug use practices in healthcare facilities.

Nigeria is the most populated sub-Saharan African country, estimated to be over 160 million persons. Following the Alma Ata Declaration of 1978, Nigeria accepted the principles of Primary Healthcare, which serves as the entry point into the formal

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healthcare system, and is expected to render the most basic healthcare services in the country. However, despite the pivotal role of primary healthcare in the nation's healthcare system, little is known with regard to drug prescribing and medication use practices. The objective of this study was to assess medication prescribing practices of healthcare professionals in primary health centres in Niger State, Nigeria.

METHODS

Study area: The study was conducted across the three Senatorial Districts in Niger State, Nigeria. Niger is one of the 6 states (excluding Abuja, the Federal Capital Territory) in North Central geographical zone in Nigeria. The state has a population of 3,950,249 persons, based on 2006 National Population and Census figures (Niger State, GIS), though about two thirds of the people reside in the rural areas. Minna, is the state capital. There are 25 Local Government Areas (LGAs) in the State with Nupe, Hausa, Gwari (Gbagyi) as the major ethnic groups (Niger State, GIS).

The following categories of Primary Healthcare facilities are available in the state - Comprehensive Health Centre, Basic Health Clinic, Maternal and Child Health Centres, Primary Health Centres/Clinics, Health Posts, and Dispensaries, managed mainly by Community Health Officers.

Prior to the study, the state was categorized into three, using the existing Senatorial Districts in the state. One Local Government Area (LGA) was randomly selected from each Senatorial District, making a total of 3 LGAs selected for the study. Thereafter, one Primary Health Centre (PHC), usually the referral centre at the LGA was selected for the study. The selected PHCs were located in Pandogari, Lapai, and Zungeru, which respectively represented the northern, southern, and eastern Senatorial Districts in the state.

Zungeru is a town located about 85km east of the State Capital, Minna. It is a rural community with history of colonial settlements and migrant railway workers. It has various ethnic tribes, but mainly Hausas, Nupe, Gwari, and Yoruba, and it is surrounded by several villages. The PHC is a 16-bed healthcare facility, which currently has a collaborative arrangement with the Federal Medical Centre, Bida. At the time of the study, there were 3 Medical Officers, 14 Nurses, 1 Pharmacist, 7 Community Health Officers (CHOs), and 4 Community Health Extension Workers (CHEWs). Patient consultations, including drug prescribing were mainly provided by the Medical Officers whenever they were available; otherwise Nurses and CHOs attended to and prescribed medications to patients.

Lapai town is located about 75km south from Minna. It has predominantly Nupe language speaking people. The PHC, Lapai, is an old institution; however, there are newer healthcare facilities in the locality, including the New Rural Hospital, Maternal and Child Health Centre, and IBB University Clinic, which serves the university community. The presence of these health facilities had reduced patient's attendance at the PHC, Lapai, except for the recently introduced free medical services through National Health Insurance Scheme–Millennium Development Goal (NHIS-MDG) programme. The PHC, Lapai, has 21-bed capacity, and the service providers were 7 Nurses, 5 Midwives, and 8 Junior Community Health Extension Workers (JCHEWs). The medical officers were available only on part-time basis, and in the absence of the medical officers, only experienced nurses were allowed to prescribe medicines for patients.

Pandogari town is located on the major Lagos-Kaduna highway and serves as transit town for most of the long distant drivers from the northern to southern parts of the country. It is located about 185km north

of Minna, the state capital. There are several villages surrounding it with many minority tribes. The most prominent ones are Fulani, Ngwai and Pangus. Due to the absence of nurses, only CHOs write prescriptions at the centre along with any available medical officer on national youth service scheme (NYSC). The clinic provides free medical services through the NHIS-MDG programme for women and children under the age of five. The study was approved by the respective management of the PHCs

Study design: This study was undertaken using the World Health Organization guideline on assessing prescribing patterns in healthcare facilities (WHO, 1993) and this guideline has been used in many other settings in the country (Enato and Chima, 2011; Enato *et al.*, 2012; and Isah *et al.*, 1997). The following core drug use indicators were assessed, average number of drugs per encounter; percentage of drugs prescribed by generic name; percentage of encounter with an antibiotic prescribed; percentage of encounter with injection prescribed, and percentage of drug prescribed from the state's essential drug list or formulary. In addition, we assessed the disease profiles of patients treated at the three healthcare facilities.

A retrospective prescription data from January to December, 2010, were used for the study. The data were abstracted from a sample of prescriptions written by the different healthcare providers in the studied PHCs. A total of 480 encounters were selected per healthcare facility, giving a total sample of 1440 across the 12 month-study period from the three PHCs. Within each healthcare facility, attempt was made to ensure that prescriptions from all prescribing healthcare providers were sampled, including those from medical officers, nurses, and community health officers. With regard to the disease profiles, only 100 patients' files/PHC, representing 50 each for medical officers and 50 non-medical officers were selected, giving a total number of patients assessed for disease profiles as 300 from the three PHCs.

Data analysis: All collected data were entered into computer Microsoft Excel Spreadsheet and sorted based on the research theme. Prescribing indicators were calculated using the WHO methods, which have also been described elsewhere (Enato and Chima, 2011, Enato *et al.*, 2012, Isah *et al.*, 1997).

RESULTS

A total of 1440 encounters, occurring between January and December 2010, were selected for the study. Upon evaluation, 8,034 drugs were prescribed by all the healthcare providers in all the three PHCs studied. The overall average number of drugs per encounter was 5.6, and the number of drugs per encounter ranged from one to twelve (Tables 1 and 2). Seventy three percent (73%) of the overall encounters had between four and seven prescribed drugs, while only 12% had between 1 and 3 drugs, and 2% between 10 and 12 prescribed drugs. Seventy one percent (71%) of the drugs were prescribed in generic names, while 82% were from the state essential drug list for primary healthcare centres. Antibiotics and injections were prescribed in 79% and 56% of the encounter, respectively (Table 2).

Forty percent (40%) of the total prescriptions were written by medical officers, 27% by nurses, 32% by community health officers, and 2% by other healthcare providers other than these mentioned above**.** Sixteen percent (16%) of the prescriptions were written for children less than 1 year old, 43% for children of between 1 and 10 years old, 27% for patients 11-30 years old, 12% for patients 31 years and above, and in 2% the actual age of the patients was not stated.

When further analysis was done to assess health facility specific performance on as regards the prescribing indicators, it was found that the average numbers of drugs per

encounter for the three PHCs were; Zungeru 4.7, Pandogari 6.0, and Lapai 6.0. The values for other prescribing indicators are as shown in Table 2. In all the three PHCs, the prescribing indicators were higher than the reference values. Also, prescribing indicators of the different providers showed that for medical officers, nurses, and community health officers, the average numbers of drug per encounter were 5.2, 5.5, and 5.5, respectively, which did not differ much. The values for other prescribing indicators for the three providers are as shown in Table 3.

Analysis of disease profile revealed that malaria/fever was the most frequently encountered medical condition at the PHCs, which accounted for 56%. Other diagnoses were abdominal pain, urinary tract infection, etc, (Table 4). The most frequently prescribed therapeutic class of drugs in this study were antibiotics (24.7%), antimalarials (20.5%), analgesic/antipyretics (18.9%), vitamins/ minerals (18.4%), and others (17.5%) (Table 5).

Table 1.0: Number of drugs per prescription

No. of drugs Prescribed	Number of prescription in n (%)			
	PHC Zungeru (n = 480)	PHC Pandogari (n = 480)	PHC Lapai (n = 480)	Overall (n = 1440)
One	10 (2%)	0 (0%)	3 (1%)	13 (1%)
Two	27 (8%)	9 (2%)	10 (2%)	46 (3%)
Three	73 (15%)	23 (5%)	26 (6%)	122 (8%)
Four	99 (21%)	49 (10%)	75 (16%)	223 (15%)
Five	105 (22%)	90 (19%)	126 (26%)	321 (22%)
Six	91 (19%)	126 (26%)	101 (21%)	318 (22%)
Seven	45 (9%)	95 (20%)	63 (13%)	203 (14%)
Eight	11 (2%)	56 (12%)	39 (8%)	106 (7%)
Nine	10 (2%)	23 (5%)	24 (5%)	57 (4%)
Ten	8 (2%)	8 (2%)	9 (2%)	25 (2%)
Eleven	0 (0%)	0 (0%)	3 (1%)	3 (0%)
Twelve	1 (0%)	1 (0%)	1 (0%)	1 (0%)

Key: PHC = Primary healthcare centre

Table 2.0: Prescribing indicators in the three PHCs located in Zungeru, Pandogari and Lapai, Niger State

Prescribing indicators	PHC Zungeru (n = 480)	PHC Pandogari (n = 480)	PHC Lapai (n = 480)	Overall (n=1440)	Ref values[a]
Average number of drugs per encounter	4.7	6	6	5.6	1.6 - 1.8
Generic drug prescription (%)	63	79	69	71	100
Antibiotic prescriptions encounter (%)	62	89	87	79	20 - 26.8
Injection prescriptions (%)	43	84	43	56	13.4 - 24.1
No. of drugs prescribed from EDL (%)	78	84	82	82	100

PHC = Primary healthcare centre, EDL = Essential drug list; a = Isah *et al*., 2002

Table 3.0: Prescribing indicators for healthcare professionals, Niger State

Prescribing indicators	Doctors (n = 575)	Nurses (n = 383)	CHOs (n = 454)	Reference values[a]
Average number of drugs per encounter	5.2	5.5	5.5	1.6 - 1.8
Generic drug prescription (%)	70	72	79	100
Antibiotic prescriptions encounter (%)	78	79	87	20 - 26.8
Injection prescriptions (%)	47	48	76	13.4 - 24.1
Number of drugs prescribed from EDL (%)	83	87	87	100

Key: CHOs = Community Health Officers; EDL = Essential drug list; a = Isah *et al.,* 2002

Table 4.0: Disease profile of patients attending primary healthcare centres in Niger State, Nigeria

	MF /F	Abd Pain	RTA	URTI	PUD	Diarr	PN	GE	EF	D & V	Hypt	UTI	Inf	Anae
PHC Zungeru	180	27	24	6	19	4	4	3	2	6	3	4	4	0
PHC Pandogari	201	32	3	10	6	13	19	15	5	9	4	9	8	7
PHC Lapai	224	16	7	16	7	10	1	3	10	1	7	1	1	3
Total number	605	75	34	32	32	27	24	21	17	16	14	14	13	10
% Freq	56	7	3	3	3	2	2	2	2	1	1	1	1	1

Table 4 (Contd.)

	Sep	EP	CP	Dys	Others	Total
PHC Zungeru	5	9	0	2	43	345
PHC Pandogari	3	0	6	5	45	400
PHC Lapai	2	0	3	2	30	344
Total	10	9	9	9	118	1089
% Freq	1	1	1	1	11	

MF/F=Malaria fever/fever, Abd=abdominal, RTA=road traffic accident, URTI=upper respiratory tract infection, PUD=peptic ulcer disease, Diarr=Diarrhoea, GE=gastroenteritis, EF=enteric fever, PN=pneumonia, D&V=diarrhoea and vomiting, Hypt=hypertension, UTI=urinary tract infection, Inf=infection, Anae=anaemia, Sep=Sepsis, EP=epigastric pain, CP=chicken pox, Dys=dysentery, Freq=frequency

Table 5.0: Classes of medications prescribed for patients at the healthcare facilities

ATC category	Therapeutic class	n	Percentage
N	Analgesic/Antipyretic	245	18.9
N	Analgesic (Narcotics)	13	1
P	Antimalarials	266	20.5
J	Antibiotic	321	24.6
A	Vitamin/Mineral	238	18.4
J	Antifungal	6	0.5
P	Anthelmintics	26	2
R	Antiallergic	18	1.4
R	Cough syrup	48	3.7
A	Antiemetic	28	2.2
A	Alimentary (GIT)	38	2.9
C	Diuretics	4	0.3
J	Antisera	11	0.8
N	Sedatives	1	0.1
V	Various others	34	2.6

DISCUSSION

The mean number of drugs per encounter assesses the degree of poly-pharmacy. The value obtained in this study is comparable to what was found in a similar study conducted at a primary health center in Edo State, Nigeria (Enato *et al*., 2012). The high degree of poly-pharmacy at the primary healthcare centres is much higher than the reported values from secondary or tertiary healthcare facilities in the country (Enato and Chima, 2011, Erah *et al.,* 2003, and Adibe *et al.*, 2009) or elsewhere (Bhartiy *et al.,* 2008; Siddiqi *et al.,* 2002; Ghimire *et al.,* 2009, and Bashrahil, 2010), and indeed the reference value (Isah *et al.*, 2002).

Though the reasons for the higher degree of poly-pharmacy at the PHCs is

unknown, it could however be a reflection of multiple complains by patients, or patients' demand, believing that the more the number of drugs prescribed the more quickly the medical condition will resolve (Soumerai, 1995). Empirical observations have shown that in many rural areas, people may endure illness for a longer period of time or may even have tried several informal sources of care such as traditional herbal homes and retail drug outlets before contacting formal healthcare facility. We also found that there was high use of injection by the healthcare providers, particularly at Pandogari PHC and by the community health officers. Patients demand may be responsible for the high use of injections, as well as the false belief that injections are better than oral formulations. Indeed, oral evidence provided by two of the research team members (MAN and DDW) is that it is a common belief among the indigenous people that injections work better than other formulations, and that any medical treatment without injection would be regarded as ineffective among the study population.

In addition, other prescribing indicators showed that there was high compliance with generic prescribing and the state essential drug list when compared to a similar study in Edo State, Nigeria. However, these values were lower than what was obtained by Adibe *et al.,* 2009) and the local reference values developed by Isah *et al* (2002). These findings are reassuring considering the fact that this study was carried out at the peripheral healthcare facility, where supporting infrastructures were expected to be weak.

Furthermore, we found high use of antibiotics, which reflect the practice in many parts of the country (Isah *et al.,* 1997; Enwere *et al.,* 2007, and Chukwuani *et al.,* 2002), and indeed other parts of the world (Al-Niemat *et al.,* 2008, and Siddiqi *et al.,* 2002). Overuse of antibiotics has public health implications, and these have variously been described in the literature, including the possible development and spread of resistance stains of micro-organisms.

Malaria and related illnesses were the most commonly encountered diagnoses, and it is therefore not surprising that anti-malarial and antibiotics were the most commonly prescribed group of medications. Overuse of antibiotics and antimalarials in the treatment of fever is common in Africa, and this practice underscores the importance of appropriate patient evaluation, including laboratory-based investigations prior to initiation of pharmacotherapy.

Though this study has shown inappropriate prescribing practices by the different healthcare workers at the PHCs in a northern state, the findings are not different from what was obtained in a similar study in a PHC in a southern state (Enato *et al.,* 2012), and indeed in secondary or tertiary healthcare facilities in the country. Several factors are noted to influence prescribing practices of healthcare providers, and these include staffing pattern, geographic location, patient factors, prescribers' factors and influence of industry, etc (WHO 2003). Some of these factors may have played significant roles in the setting under which this study was undertaken, though these were not evaluated. However, to improve drug use practices in the country there would be the need to properly evaluate the contributing factors for inappropriate prescribing with a view to designing suitable intervention programme. In addition, the authors believe that the teaching of clinical pharmacology and rational drug use should be improved in the undergraduate curricula of healthcare providers in the country.

Conclusion

Similar to other healthcare facilities in the country, drug prescribing was found to be inappropriate at the primary healthcare centres in Niger State. We recommend

interventions that would improve drug use practices at the primary care level; as such interventions would positively impact on the quality of care received by patients at this level of healthcare.

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