ASSESSMENT OF DISEASES AND THEIR MANAGEMENTS AT TWO HEALTH CENTERS ON WILBERFORCE ISLAND IN BAYELSA STATE OF NIGER DELTA AREA, NIGERIA

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ABSTRACT

Importance of assessment of medication management of diseases at a given facility is informed by the need to ascertain that patients requiring treatments are being offered medications in line with local essential drug list and treatment guidelines, supported by WHO drug use standards. The purpose of this study was to assess incidence of diseases and their medication management at Niger Delta University Health Center (NDUHC) and Amassoma Comprehensive Health Center (ACHC) in Bayelsa State, Nigeria. Six hundred and sixty eight and 553 case notes belonging to patients who attended NDUHC and ACHC from January 1st to December 31st, 2014 were reviewed retrospectively using systematic random sampling technique. They were assessed for diagnoses and pattern of medication use, including associated drug related problems (DRPs). Data were analyzed as appropriate, and p-value <0.05 at 2-tailed considered significant. Mean patients' ages at NDUHC and ACHC were 26.08±8.97and 23.01±20.70 years (p<0.05) with average numbers of disease diagnosed per encounter of 1.40±0.63 and 1.94±0.68 (p<0.0001) respectively. Incidences of malaria of 39.4 % (at NDUHC) and 39.1% (at ACHC) were the highest of all diagnoses, and the most prescribed medications were antibacterials (18.9%; 28.6%), analgesics (22.5%; 20.9%), and multivitamins (16.6%; 18.1%). The respective average numbers of drugs prescribed per encounter at the NDUHC and ACHC were 4.0 ± 1.40 and 4.32 ± 1.12 (p<0.0001). Mean numbers of DRPs per encounter were 0.70±0.81 (at NDUHC) and 1.60±0.52 (at ACHC), (p<0.0001), while unnecessary drug therapy (40.2%; 44.0%) and need for additional drug therapy (35.1%; 27.4%) were the most encountered DRPs at the respective facilities. Malaria was the most prevalent condition treated and prescription patterns were sub-optimal in both health centers. There is a need for adequate training and retraining of healthcare personnel who work at health centers in this locality for effective patient care.

KEYWORDS: *Community Health Workers, Drug related problems, Health center, Medication use, Niger Delta*

INTRODUCTION

The World Health Organization (WHO) has defined health as "a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity" [1]. A deviation from the foregoing has been variously described to constitute – a disease, illness, or sickness [2]. In addition, failure to initiate timely, effective, adequate and affordable treatment modalities in addressing unhealthy presentations in any given population has been reported to be associated with increased morbidity and mortality rates. Consequences of these are avoidable costs in human, social and economic terms [3, 4].

Effective treatment or management of diseases requires the initiation and maintenance of requisite therapies. These may involve either pharmacologic or non-pharmacologic means, or both. Incidentally, medication use forms the basis of most therapies [5]. When drugs are prescribed, issues bordering on rationality are usually of major concerns [6]. Accordingly, WHO posited that: achieving optimal therapeutic outcomes requires that concerned "patients receive medications appropriate to their clinical needs, in doses that meet their own

individual requirements, for adequate period of time, at lowest cost to them and their community" [7]. This is in a bid to ensure and maintain a healthy and productive society. Furthermore, necessary information are required to assess whether drug therapy is rational or not in any given healthcare setting. Such task can readily be accomplished with the aid of drug utilization studies otherwise referred to as drug use audit. This entails adoption of standardized methodology coupled with the application of WHO drug use indicators especially for comparisons of modalities for drug use in different health institutions [8].

The importance of assessing drug utilization in a given health facility is informed by the need to ascertain that patients requiring medication treatments are actually being offered required medications in line with local essential drug list and standard treatment guidelines, supported by WHO drug use standards [6, 9]. Thus, patients receive drugs that satisfy their health care needs with minimal or no adverse effects. Such drugs are also expected to be readily available at all times, in adequate amounts, at minimal cost, and in the appropriate dosage forms [7, 9]. The end result of this is such that patients experience positive impacts on their overall quality of life from the instituted therapies. Unfortunately, the foregoing are hardly achievable considering the high rates of reported irrational prescribing, faulty drug dispensing, unethical drug distribution and patients' non-adherence to therapy. Admittedly, these issues are not only limited to the developing countries as similar scenario has been widely reported in climes with more robust healthcare system [6,10].

Owing to the abovementioned facts and given the dearth of published studies in medication treatment of diseases in Bayelsa State, this study aimed to assess the pattern of disease presentations, their medication management, and associated drug related problems using selected indicators as guides at two healthcare centers located in the Southern Ijaw Local Government Area of Bayelsa State, South-south Nigeria.

MATERIALS AND METHODS
Setting

The study was conducted at the Niger Delta University Health Center (NDUHC) and Amassoma community Comprehensive Health Center (ACHC) both of which are located on Wilberforce Island in Southern Ijaw Local Government Area, Bayelsa State, South-South, Nigeria. The NDUHC is administered by Niger Delta University Health

Services Department while ACHC falls within the jurisdiction of Southern Ijaw Local Government Area of Bayelsa State, Nigeria.

The NDUHC is a 7-functional-bed capacity health facility located on the main campus of the university. This health center provides basic healthcare needs for the students and the university staff, including their dependants. It recorded about 4,904 patient-loads in 2014. It is staffed by a Medical Director and four Medical Officers who conduct the medical activities, 17 Nurses who see to nursing needs of the patients, and a Pharmacist assisted by 2 Pharmacy Technicians and 3 Pharmacy Assistants who are in charge of patients' drug requirements. On the other hand, the ACHC is a 13-bed capacity facility which primarily caters for the healthcare services of residents of Amassoma community comprising approximately of 6,970 indigenous people [11]. The patients' turnover at the facility in 2014 was 1,077. Here, diagnosis, prescribing, nursing of patients, and child delivery are done by 4 Senior Community Health workers (SCHEWs) assisted by 6 Junior Community Health Workers (JCHEWs). Meanwhile, a Pharmacist and a Pharmacy Technician attend to patients' medication needs at the center.

Study design

Ethical approvals for the study were obtained from the managements of the two health centers. Six hundred and sixty eight and 553 case notes belonging to patients who attended the NDUHC and ACHC respectively, from January 1st to December 31st, 2014 were reviewed retrospectively using systematic random sampling technique while allowing for overage. The patients' attendant registers were used as guides. The sample size was informed by the specification contained in a WHO document on "how to investigate drug use in health facilities" [12], and aided by Sample Size Table by Research Advisor [13] at 95 % confidence interval and 5 % margin of error.

Data collection

A data collection form was developed and employed for the gathering of the required patients' information. These included; patients' socio-demographics, their disease conditions, and respective medications prescribed for their management. The medication details recorded were: name (generic or brand), dosages, duration of therapy including associated drug related problems (DRPs).

Main outcomes measures were incidence of diseases, pattern of drug utilization (inclusive of prescribing indicators) and Drug Related Problems (DRPs) observed in prescribing practices at the healthcare centers. Drug related problems were established majorly with the aid of clinical judgments and some respective treatment guidelines for conditions encountered. They were categorized in accordance with DRPs classification by Strand et al. [14].

Data analysis

Data generated were analyzed withStatistical Package for Social Sciences (SPSS) version 20.0 and GraphPadInstat 3.10 for windows (GraphPad Software, San Diego California USA). They were presentedusing descriptive statistics.Mean values were compared using student t-test while categorical variables were evaluated using Chi-squared test. A p-value < 0.05 at 2-tail was considered significant.

RESULTS

More females presented for treatments at the NDUHC (55.2 %) and ACHC (64.4 %) than males (p < 0.05) within the period considered for the study. Adults aged; 18 – 49 years (95.1 %) were the most seen at the NDUHC followed by the elderly individuals (4.0 %), the least been the children (0.9 %). On the other hand, more children (44.9 %) than the adults (42.3 %) and the elderly patients (12.8 %) were encountered at the ACHC. Meanwhile, the patients seen at the university based health center were majorly the students (80.7 %) and the university staff (18.4 %). At the community health center, most of the patients encountered were the unemployed (44.5 %) and students (19.7 %). They were followed by the civil servants (16.5 %), traders (11.2 %), farmers (5.4 %), artisans (2.5 %), and the retirees (0.2 %), (Table 1).

Average numbers of diseases diagnosed per encounter at the NDUHC and ACHC were 1.40 ± 0.63 and 1.94 ± 0.68 (p < 0.0001) respectively. Most of the patients who attended the NDUHC within the period considered presented with malaria (39.4 %), respiratory tract infections (12.7 %), venereal infections (9.0 %), and peptic ulcer diseases (7.8 %) amongst others. At the ACHC, most of the patients also presented with malaria (39.1 %), but followed by those with typhoid fever (19.6 %), respiratory tract infections (10.6 %), and venereal infections (9.7 %) among other diseases encountered (Table 2).

The bulk of all drugs prescribed for patients who attended NDUHC within the study period considered were analgesics (22.5 %), antibiotics (18.9 %), multivitamins (17.0 %), and antimalarials (16.6 %). Meanwhile, antibiotics (28.6 %), analgesics (20.9 %), multivitamins (18.1 %), and antimalarials (17.9 %) were the most encountered of all drugs prescribed at the ACHC. Other medications were also prescribed for patients at the two health centers though, to lesser extent compared to aforementioned ones (Table 3).

A total of 882 DRPs were detected in the prescribing practice at ACHC compared to only 462 which were identified at the NDUHC. Among these, unnecessary drug therapy (44.0 %, at ACHC vs. 40.2 %, at NDUHC) and need for additional drug therapy (27.4 %, at ACHC vs. 35.1 %, at NDUHC) were the most encountered. Average numbers of DRPs per encounter at the two centers were 1.60 ± 0.52 and 0.70 ± 0.81 (p < 0.0001) which translated into %DRP detection of 37.5 and 17.9 at ACHC and NDUHC respectively (Table 4).

On the average, 4.0 ± 1.40 and 4.32 ± 1.12 (p < 0.0001) drugs were prescribed per encounter at NDUHC and ACHC within the study period considered. Percentage of encounters with antibiotics, injections, and percentage of drugs prescribed by their generic names at the facilities (i.e. NDUHC and ACHC) were 59.1 % vs. 86.8 %, 31.6 % vs. 14.3 %, and 38.9 % vs. 47.9 % respectively (Table 5).

DISCUSSION

Majority of the patients who visited the two health centers within the study period presented with malaria. This finding is consistent with that earlier related in a study conducted at a secondary healthcare facility which is also located within the same community as the present study centers [16]. Average number of diseases of 1.94 ± 0.68 diagnosed per patient encountered at the health center in the community was more compared to 1.40 ± 0.63 reported at the university based health center. Antibacterial agents, analgesics, multivitamins as well as antimalarials amongst others were the most prescribed medications for the patients treated in this study. The mean DRPs per encounter of 1.60 ± 0.52 detected in the prescribing practice in the community health center was higher than 0.70 ± 0.81 observed at the university health center with corresponding %DRP detection of 37.5 and 17.9. Polypharmacy was observed at the two study centers though, at higher rate in the center with CHEWs as the sole prescribers compared to the center where doctors are the prescribers. more

among indigenous patients who presented at the community health center compared to only few individuals who reported with the infection at the university based health center. Sources of typhoid fever have been reportedly associated with proximity to rivers, poverty, poor housing, poor education, poor lifestyle, inadequate food hygiene, objectionable sources of drinking water among other factors [17, 18].

Table 1: Patients' Socio-demographics

Characteristics	NDUHC, n = 668, N (%)	ACHC, n = 553, N (%)
Gender		
Male	299 (44.8)	197 (35.6)
Female	369 (55.2)	356 (64.4)
Chi-squared test	$\chi^2 = 10.095$, df = 1, p = 0.0015	
Age (years)		
Children (< 18)	6 (0.9)	248 (44.9)
Adult (18 – 49)	635 (95.1)	234 (42.3)
Elderly (≥ 50)	27 (4.0)	71 (12.8)
Average patient age (Mean ± SD)	26.08 ± 8.97	23.01 ± 20.70
Occupation		
Students	539 (80.7)	109 (19.7)
Civil servants	123 (18.4)	91 (16.5)
Traders	0 (0.0)	62 (11.2)
Artisans	0 (0.0)	14 (2.5)
Farmers	0 (0.0)	30 (5.4)
Retired	0 (0.0)	1 (0.2)
Unemployed/Dependants	6 (0.9)	246 (44.5)

N, number of observations; n, sample size; SD, standard deviation

ble 2: Patients' Diagnosis at the Health Centers

Disease	NDUHC, n = 999, N (%)	ACHC, n = 1,084, N (%)
Malaria	394 (39.4)	424 (39.1)
Respiratory tract infections	127 (12.7)	115 (10.6)
Venereal infections	90 (9.0)	105 (9.7)
Peptic ulcer disease	78 (7.8)	13 (1.2)
Diarrhoea	25 (2.5)	44 (4.1)
Allergic reactions	22 (2.2)	6 (0.5)
Arthritis	24 (2.4)	1 (0.1)
Eye disorders	16 (1.6)	3 (0.3)
Cardiovascular disorders	15 (1.5)	17 (1.6)
Dysmenorrhoea	15 (1.5)	3 (0.3)
Helminthiasis	13 (1.3)	9 (0.8)
Asthma	8 (0.8)	20 (1.8)
Diabetes	6 (0.6)	2 (0.2)
Anxiety	6 (0.6)	0 (0.0)
Anaemia	5 (0.5)	3 (0.3)
Typhoid	3 (0.3)	212 (19.6)
Appendicitis	3 (0.3)	1 (0.1)
Candidiasis	0 (0.0)	5 (0.4)
Chicken pox/measles	3 (0.3)	9 (0.8)
Haemorrhoids	2 (0.2)	3 (0.3)
Others	144 (14.4)	89 (8.2)
Average number of disease per encounter (Mean ± SD)	1.40 ± 0.63[a]	1.94 ± 0.68[b]
Student t-test	[a,b] p < 0.0001	

Table 3: Classes of drugs prescribed for the diseases encountered at the health centers

Drugs	NDUHC, n = 2,576, N (%)	ACHC, n = 2,350, N (%)
Analgesics	580 (22.5)	491 (20.9)
Antibacterials	487 (18.9)	671 (28.6)
Multivitamins	437 (17.0)	426 (18.1)
Antimalarial	427 (16.6)	421 (17.9)
Antihistamines	148 (5.7)	7 (0.2)
Peptic ulcer drugs	84 (3.3)	36 (1.5)
Antitussives	38 (1.5)	18 (0.8)
Antifungals	37 (1.4)	32 (1.4)
Cardiovascular drugs	33 (1.3)	17 (0.7)
Benzodiazepines	27 (1.0)	8 (0.3)
Anthelminthic	20 (0.8)	20 (0.9)
Anti-asthmatics	16 (0.6)	40 (1.7)
Antidiabetics	10 (0.4)	0 (0.0)
Antidiarrheal	10 (0.4)	2 (0.1)
Eye remedies	8 (0.3)	2 (0.1)
Hormonal preparations	6 (0.2)	2 (0.1)
Others	208 (8.1)	157 (6.7)

Table 4: Categories of Drug Related Problems (DRPs) detected in prescriptions

Drug Therapy Problems	NDUHC, n = 462, N (%)	ACHC, n = 882, N (%)
Unnecessary drug therapy	186 (40.2)	388 (44.0)
Need for additional drug therapy	162 (35.1)	242 (27.4)
Drug interaction	57 (12.3)	99 (11.2)
Wrong drug therapy	41 (8.9)	77 (8.7)
Dosage too low	7 (1.5)	62 (7.0)
Dosage too high	4 (0.9)	7 (0.8)
Adverse drug reaction	5 (1.1)	7 (0.8)
Average number of DRPs*	0.70 ± 0.81^c	1.60 ± 0.52^d
Student t-test	$^{c,d}p < 0.0001$	
% DTPs detection	17.9	37.5

*(Mean ± SD)

Table 5: Selected Prescribing Indicators

Indicators	NDUHC, N (%)	ACHC, N (%)	Standard values*
Average number of drugs prescribed per encounter, (mean ± SD)	4.0 ± 1.40^e	4.32 ± 1.12^f	(1.6 – 1.8)*
Student t-test	$^{e,f}p < 0.0001$		
Percentage of encounters with antibiotics, (%)	59.1	86.8	(20.0 – 26.8)*
Percentage of encounters with injections, (%)	31.6	14.3	(13.4 – 24.1)*
Percentage of drugs prescribed by their generic names, (%)	38.9,	47.9	100*

*Standard culled from the work of Isah et al. [15].

Unfortunately, these kinds of conditions are prevailing in Amassoma community [19]. Thus, the skewed typhoid presentation implies that hygiene education and appropriate infrastructures are needed among the residents of this community given the linked between typhoid infection and low level of hygiene. Other diseases such as respiratory tract infections, venereal infections, peptic ulcer disease, and diarrhoea were extensively diagnosed at the two study centers. Similar to contributory factors for typhoid infection, a number of reasons among which include swampy nature of the locality, the level of penury, lack of toilets and potable drinking water as well as improper waste disposal in many households in the community have been implicated in the spread of most of these infections [16, 20]. Complicating the situation, there are no enough university administered students' hostels and decent staff quarters. Hence, a sizable population of the students and staff of the university are conditioned to reside closely with indigenes of

the community within the same vicinity. Thus, they are equally exposed to environmental and other infrastructural challenges which bear causal relationship to the compromised level of hygiene in the community as previously noted [16, 19]. Similitude of these observations abounds in most parts of Africa, and may be suggested to have informed the ever increasing prevalence of communicable diseases in the region [4, 21].

Second to malaria, typhoid fever was diagnosed Mode of prescribing of medications at the two health centers notably antibacterial agents, analgesics, multivitamins as well as antimalarials reflects the pattern of presentation of array of diseases diagnosed and characteristics of the patients treated as previously elucidated in studies conducted earlier in the locality [16, 22]. Unfortunately, the prescribing practices at the centers were fraught with many DRPs. Practices at the facility located in the community presented a worst case scenario. Of these, unnecessary drug therapy, need for additional drug therapy, and drug interactions were the most encountered. It was noted that diagnosis and prescribing of medications for treatment of diseases including nursing of patients are the exclusive preserve of the community health workers (CHEWs) at ACHC. This is contrary to what obtains at the NDUHC where there are Medical doctors, Nurses and Pharmacists with ingrained capabilities and appropriately spelt out responsibilities. This may be the reason for the higher incidence of DRPs noted at this center. This is because it has been noted that most CHEWs are often deficient in required knowledge to effectively discharge their responsibilities in appropriate patient careespecially in rural settings where their activities are highly sought. To this end, several recommendations have been advanced to help them in overcoming this major challenge.Most important of these include training and retraining to foster long-term knowledge in them [23].

Similar to DRPs reported above, selected prescribing indicators assessed at the two facilities did not fall within specified standards except for percentage of encounters with injections at the ACHC.

Interpretation of this study is limited only to the two health centers (in the Niger Delta Area) assessed. However, there is a need to develop appropriate strategies geared towards maximizing potentials of healthcare personnel in this locality for effective discharge of their duties to patients as required.

CONCLUSION

Malaria, typhoid fever, respiratory tract infections, and venereal infections were the most prevalent conditions treated in this study. Prescribing practices at the facilities studied were fraught with polypharmacy and DRPs. Hence, these findings reinforce the need for adequate training and retraining of healthcare personnel who work in this locality for effective patient care.

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