The evaluation of prescribing practices of Antipsychotic medication in tertiary health institution in Benin City, Nigeria

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ABSTRACT

The aims of the study are to investigate the prescribing pattern and its' trend using the WHO prescribing indicators.A retrospective studyof outpatient's prescriptions sheets from 2013 to 2017 in both facilities using systematic random sampling. Average number of drugs per encounter, percentage of prescriptions in generic name, percentage of antibiotics, percentage of injection encounter, drugs prescribed from essential drug list and DDD/1000 inhabitants/day were determined.

Results obtained were that a total number of 2581 prescriptions from FNPH and 1857 prescriptions from UBTH were collected. Lowest average numbers of drugs per encounter in FNPH was 2.54 in 2014 while that of UBTH in 2014 gave 2.32. Highest percentage of medications prescribed in generic name was 96.67 in 2015 for FNPH and 91.91 in 2013 for UBTH. In FNPH, the number of persons on haloperidol on a daily basis decreased from10 in 2013 to 4 in 2017, while that of olanzapine increased from 3 in 2013 to 7in 2017. In conclusion, both facilities fell short of WHO indicators for average number of drugs per encounter, percentage of medicines prescribed in generic name. There was a decline in the prescribing of typical antipsychotics while that of atypical antipsychotics increased in FNPH.

INTRODUCTION

Drug utilization research entails the prescription and use of medications with emphasis on the resulting medical, social, and economic consequences.[1]. The main objective of the drug utilization research is to enhance the rational use of the medications[1]. Without the knowledge of how the drugs are being prescribed, it is difficult to suggest the measures to improve prescribing habits. World Health Organization (WHO) can be referred to as rational use of medicines as patients receive medications adequate to their clinical needs, in doses that meet their own individual requirements, for an adequate period of time, and at the lowest cost to them and their community[2].Researches have revealed that over half of all medicines worldwide are prescribed or sold incorrectly and half of the patients use their medications incorrectly [3]. Irrational utilization of medicines can lead to among others therapeutic failure, increase in adverse effects of medications and increase in morbidity and mortality associated with chronic conditions such as psychiatric and neurological

disorders while rational prescribing practices result in safe and effective treatment, quick remission of disease, improves quality of life of patients and decreased medication costs [4,5], hence WHO has put in place drug use indicators of which prescribing indicators assess the prescribing practice of any setting to know whether the physicians are promotion rational drug use or not. The use of antipsychotic medications is one of the well developed and advanced therapies in schizophrenia and related conditions [6, 7]. These medications as well as other medications need to be used in a rational manner hence this study which to the best of our knowledge has not be done in recent time in the settings chosen for the study.

Finding from this research on the current prescribing practices of antipsychotic medications in Benin City will be beneficial to physicians, health professionals, policy makers as well as researchers as it will provide insight into what extent rational prescribing of antipsychotics is attained, which may improve the attitude of the clinicians toward achieving rational prescribed as stipulated by World Health Organization (WHO).

Objectives of the study:

♦ To investigate the prescribing practices in the study sites by employing the WHO prescribing indicators

♦ To investigate the trend in the prescribing pattern over the 5 years period of study

♦ To compare the prescribing pattern of two psychiatric health institutions in the same locality.

METHODS

Settings

The study was conducted at Federal Neuro-Psychiatric Hospital (FNPH) and also University of Benin Teaching Hospital (UBTH), all in Benin City, Nigeria, and as at time of study both facilities happened to be the only tertiary hospitals that provide mental or psychiatric medical services in Benin City.. FNPH, which is over 200-bed specialized tertiary hospital in Nigeria. The institution mainly specializes in psychiatric and neurological disorders. It serves the people (of about 13, 000,000) residing in the state.Other states benefiting from this service neighboring include Delta,Anambra, Kogi, Ondo and Rivers state. The institution has in its employ consultant psychiatrists, physicians, pharmacists, intern pharmacists, pharmacy technicians, nurses, clinical psychologists. University of Benin Teaching Hospital (UBTH), Benin City with over 800 bedded spaces, is also a tertiary hospital that has several specializations including mental (psychiatric) health. It serves the state (Edo state) and other south south states in the country such as Bayelsa, Cross River. Various health professionals are employed by the institution.

Research ethical approval

Approval for this study was obtained from the different hospitals' research and ethics committee, with reference number for FNPH, PH/A.864/vol.vii/12 and UBTH protocol number ADM/E22/A/vol.vii/1422

Study design: A retrospective studyof prescriptions sheets prescribed to patient from 2013 to 2017.

Data collection

For both study sites, the prescription sheets of patients seen over the study period were collected from pharmacy department of FNPH and the pharmacy unit in Consultant Out Patient Department (COPD) of UBTH where antipsychotics outpatients prescriptions are assessed, medications dispensed and patients who were being managed of schizophrenia and other related conditions were counseled on the rational use of their medications by pharmacists. Data were collated chronologically and later separated according to the year of prescription. For the purpose of this study, 1st January 2013 to 31st December 2013 was referred to as year 1, 1st January 2014 to 31st December 2014 as year 2, 1st January 2015 to 31st December 2015 as year 3, 1st January 2016 to 31st December 2016 referred to as year 4 and 1st January 2017 to 31st December, 2017 was referred as year 5.Sampling size determination and sampling technique: In FNPH, an average of 70 prescriptions were being attended to on each working day (Monday to Friday), while an average of 20 prescriptions on each weekend (Saturday to Sunday) which amount to about 390 prescriptions per week and then 20280 prescriptions in a year. For each of the year, sample size determination formula, n = N/1+N (e^2), where N (population) = (19300), e (precision)=(0.05), n (sample size), which was approx. 400 prescriptions. Same sampling size determination was employed in prescriptions from UBTH, in that the daily antipsychotic prescriptions from the teaching hospital was 10 prescriptions giving 3650 prescriptions per year which resulted into sample size of 360 prescriptions per year. Systematic random sampling was adopted for both institutions. The prescriptions data for every 50th person of FNPH while that of UBTH was that of every 10th person were selected for inclusion. Author's developed proforma was used to collect information, such as date of prescription, age and sex of the patient, number of drugs per prescription, number of drugs prescribed by generic name, number of prescriptions with antibiotics, number of drugs prescribed from the essential drugs list, number of drugs prescribed but not available. In addition, total number of persons prescribed a certain drug on a daily basis during the study period was calculated, as well as the frequency of such prescriptions was also determined.

Data analysis

Data collected was entered and sorted using Microsoft Excel while GraphPadinstat version 3.10 was used for inferential analysis. The prescribing indicators were determined using the WHO guideline, which include average number of drugs per encounter, percentage of drugs prescribed by generic name or from essential drugs list, and percentage of encounters during which an antibiotic or injection was prescribed. Average number of drugs per encounter was calculated by dividing the total number of different drug products prescribed by the total number of encounters surveyed. Percentage of drug prescribed by generic name was determined by dividing the number of drugs prescribed by generic by the total number of drugs multiplied by 100. Percentage of encounter with an antibiotic prescribed was then calculated by dividing the number of patient encounters during which an antibiotic was prescribed by the total number of encounters surveyed multiplied by 100. Percentage of drugs prescribed from essential drugs list was gotten by dividing the total number of products prescribed from \WHO essential drug list [8] by the total number of drugs prescribed multiplied by 100. Percentage of drugs prescribed but not available was also determined by dividing the number of encounters during which at least a drug was out of stock by the total number of encounters multiplied by 100. Another indicator that was gotten was the DDD/1000 inhabitants/day of the antipsychotics (haloperidol, chlorpromazine, trifluoperazine, fluphenazine, olanzapine, risperidol, flupentixol) used in these settings.[9],[10] The DDD/1000 inhabitants/day is calculated using the Anatomic Therapeutic Chemical (ATC) classification [9], and Defined Daily Dose (DDD) assignment as given by WHO collaborating center for drug statistics methodology. DDD/1000 inhabitants/day is the amount of drugs used in one year (mg) multiplied by one thousand divided by ATC DDD (mg) and population study duration (in days), the formula of DDD/1000 inhabitants/day is

$$\frac{\text{Units used I in yr X strength (mg) X 1000}}{\text{ATC DDD (mg) X sample size X study duration (in days)}}$$

From DDD/1000 inhabitants/day, the daily number of persons who were prescribed certain medications in each in the various health care facilities was determined. Student t-test (two - tail) statistics was used to determine if there was any significant difference between numberof populace prescribed a particular drug in the two settings for the period of study. Significance was only considered when the p-value was ≤ 0.05.

RESULTS

A total number of 2581 prescriptions were collected from FNPH which consisted of female, 1058 (40.9%) and male 1522 (59.1%) while that of UBTH was 1857 prescriptions which comprised female, 695 (37.4%) and male 1162 (62.6%). The average numbers of drugs per encounter for FNPH in 2017 had a value of 2.804 while that of UBTH was in 2016 gave 2.52. FNPH had percentage of encounter with antibiotic encounter of 0.60 in 2015 and that of UBTH was 1.77 in 2017, percentage of medication prescribed in generic name was 96.67 in 2015 for FNPH and 91.91 in 2013 for UBTH (Table 1).

Differences between FNPH and UBTH exist in average number of drug per prescription, percentage of drugs prescribed in generic name and percentage of drugs prescribed from essential drug list (Table 2)

In FNPH, prescriptions on daily basis for oral antipsychotic medications had the highest number of (11) persons for haloperidol in the year 2013, also about 9 persons were prescribed haloperidol in the year 2014, trifluoperazine took the lead in 2015 with daily prescribed number of prescriptions at nearly 7 persons, then olanzapine in 2016 and 2017 which gave about 7 persons in each year. In another study site, UBTH, chlorpromazine was the mostly prescribed medication per population with about 3

Table 1 : Medications prescribing practices based on World Health Organization guidelines

Year	Prescribing Practice	FNPH	UBTH	Ref value
2013				
	Average number drugs per prescription	2.59	2.35	1.6-1.8
	Percentage of drug prescribed in generic name	95.57	91.91	100
	Percentage of antibiotics prescribed	1.2	5.22	20.0 - 26.8
	Percentage of injection prescribed	12.98	15.14	13.4-24.1
	Percentage of drugs from essential drug list	91.70	90.90	100
	Percentage of out of stock	7.08	15.45	Nil
2014				
	Average number drugs per prescription	2.54	2.32	1.6 - 1.8
	Percentage of drug prescribed in generic name	92.48	92.87	100
	Percentage of antibiotics prescribed	3.18	3.50	20.0 - 26.8
	Percentage of injection prescribed	16.30	12.87	13.4 - 24.1
	Percentage of drugs from essential drug list	92.78	90.60	100
	Percentage of out of stock	13.31	14.27	Nil
2015				
	Average number drugs per prescription	2.55	2.44	1.6 - 1.8
	Percentage of drug prescribed in generic name	96.67	85.93	100
	Percentage of antibiotics prescribed	0.60	2.85	20.0 - 26.8
	Percentage of injection prescribed	16.54	7.85	13.4 - 24.1
	Percentage of drugs from essential drug list	91.47	88.88	100
	Percentage of out of stock	5.87	10.49	Nil

KEY: FNPH = Federal Neuro-Psychiatric Hospital, Benin City,
UBTH = University of Benin Teaching Hospital, Benin City.

Table 1 Continued: Medications prescribing practices based on World Health Organization guidelines

Year	Prescribing Practice	FNPH	UBTH	Ref value
2016				
	Average number drugs per prescription	2.72	2.52	1.6 - 1.8
	Percentage of drug prescribed in generic name	91.84	90.29	100
	Percentage of antibiotics prescribed	1.52	2.49	20.0 - 26.8
	Percentage of injection prescribed	15.56	12.07	13.4 - 24.1
	Percentage of drugs from essential drug list	91.52	91.46	100
	Percentage of out of stock	5.56	12.50	Nil
2017				
	Average number drugs per prescription	2.804	2.49	1.6 - 1.8
	Percentage of drug prescribed in generic name	94.11	90.16	100
	Percentage of antibiotics prescribed	2.59	1.77	20.0 - 26.8
	Percentage of injection prescribed	16.96	1.08	13.4 - 24.1
	Percentage of drugs from essential drug list	92.79	91.46	100
	Percentage of out of stock	10.50	9.95	Nil

KEY: FNPH = Federal Neuro-Psychiatric Hospital, Benin City,
UBTH = University of Benin Teaching Hospital, Benin City.

Table 2 : Differences in prescribing indicator ± SD in both settings from 2013 - 2017

Indicator	FNPH	UBTH	P values
Average no of drugs per prescription	2.64 ± 0.12	2.42 ± 0.09	P = **0.01**
Percentage of drugs prescribed in generic name	94.13 ± 2.03	90.23 ± 2.66	P = **0.03**
Percentage of antibiotics prescribed	1.82 ± 1.05	3.17 ± 1.31	P = 0.109
Percentage of injection prescribed	15.67 ± 1.59	9.80 ± 5.54	P = 0.053
Percentage of drugs prescribed from essential drug list	92.05 ± 0.67	90.66 ± 1.06	P = **0.0382**
Percentage of out of stock	8.46 ± 3.34	12.53 ± 2.37	P = 0.0571

KEY: FNPH = Federal Neuro-Psychiatric Hospital, Benin City,
UBTH = University of Benin Teaching Hospital, Benin City.

Table 3 : Drug utilization of oral antipsychotic medications

Year	Name & dose (mg)	DDD (mg)	FNPH				UBTH			
2013			Unit, N=514	DDD/ 1000/ day	% Pop	Actual Pop	Unit, N=386	DDD/ 1000/ Day	% Pop	Actual Pop
	Tri 5	20	11936	15.87	1.587	8.16	3208	5.61	0.561	2.17
	Hal 2	8	6145	20.45	2.045	10.51	1324	5.79	0.579	2.23
	Chl 100	300	9156	16.26	1.626	8.36	3739	8.73	0.873	3.37
	Ris 2	5	2297	4.89	0.489	2.51	1887	5.28	0.528	2.04
	Ola 5	10	2311	6.16	0.616	3.17	2308	8.08	0.808	3.12
2014			N=509				N=368	.		
	Tri 5	20	12602	16.98	1.698	8.64	1514	2.29	0.229	0.84
	Hal 2	8	5454	18.41	1.841	9.37	1514	7.01	0.701	2.58
	Chl 100	300	7970	14.35	1.435	7.30	2323	5.74	0.574	2.10
	Ris 2	5	2431	5.25	0.525	2.67	1465	4.34	0.434	1.60
	Ola 5	10	3950	10.67	1.067	5.43	1507	5.58	0.558	2.05
2015			N=519	.			N=362			
	Tri 5	20	10106	13.3	1.33	6.90	3170	6.01	0.610	2.20
	Hal 2	8	3627	11.96	1.196	6.21	1713	8.09	0.809	2.92
	Chl 100	300	5993	10.54	1.054	5.47	6180	15.57	1.557	5.63
	Ris 2	5	2183	4.61	0.461	2.39	3086	9.34	0.934	3.38
	Ola 5	10	4474	11.8	1.18	6.12	3283	12.4	1.24	4.48

KEY: FNPH = Federal Neuro-Psychiatric hospital, Benin City, UBTH = University of Benin Teaching hospital, Benin City, N = sample size for the year. Pop = population, Tri = Trifuloperazine, Hal = Haloperidol, Chl=Chlopromazine, Ris = Risperidone, Ola = Olanzapine

prescriptions per day in 2013. In 2014, it was haloperidol with a value of about 3 patients per day, while olanzapine was the most prescribed in 2015 (nearly 4 persons) and 2016 (not less than 5 persons) then haloperidol in 2017 which was prescribed to an average of 5 persons per day, (Table 3).

In both institutions, parenteral fluphenazine (depot) had the highest population per day in all the years (2013, 2014, 2015, 2016, 2017). Fluphenazine (depot) prescriptions, 20, 29, 21, 25 and 28 persons per day were given in 2013, 2014, 2015, 2016 and 2017 respectively in FNPH, while that of UBTH, 6, 5, 8, 7 and 6 persons per day were placed on the drug in the year 2013, 2014,

2015, 2016 and 2017 respectively, (Table 4).

FNPH showed a decreasing trend in the prescriptions of oral atypical antipsychotics for trifluoperazine (8 persons per day in 2013 to 4 persons per day in 2017), haloperidol (10 persons per day in 2013 to 4 persons per day in 2017), chlorpromazine (8 patients per day in 2013 to about 5 patients per day in 2017) while there was increasing order in the prescriptions of oral atypical antipsychotics, risperidone (about 3 individuals per day in 2013 to at least 5 individuals per day in 2017) and olanzapine (3 patients per day in 2013 to 7 patients per day in 2017), while prescriptions of antipsychotics at UBTH showed no definite

Table 3 Continued: Drug utilization of oral antipsychotic medications

Year	Name & dose (mg)	DDD (mg)	FNPH				UBTH			
2016			N=531				N=363			
	Tri 5	20	8153	10.51	1.051	5.58	1705	3.22	0.322	1.17
	Hal 2	8	2864	9.22	0.922	4.90	879	3.98	0.398	1.44
	Chl 100	300	6268	10.81	1.081	5.74	3490	8.79	0.879	3.19
	Ris 2	5	3778	7.79	0.779	4.14	2193	6.63	0.663	2.41
	Ola 5	10	5220	13.46	1.346	7.15	2911	10.99	1.099	3.98
2017			N=508	.			N=378			
	Tri 5	20	6002	8.06	0.806	4.09	1504	3.71	0.371	1.40
	Hal 2	8	2556	8.61	0.861	4.39	3111	14.08	1.408	5.32
	Chl 100	300	5274	9.48	0.948	4.82	2434	6.13	0.613	2.31
	Ris 2	5	3885	8.37	0.837	4.25	2220	6.35	0.635	2.40
	Ola 5m	10	4933	13.29	1.329	6.75	1772	6.69	0.669	2.52

KEY: FNPH = Federal Neuro-Psychiatric hospital, Benin City, UBTH = University of Benin Teaching hospital, Benin City, N = sample size for the year. Pop = population, Tri = Trifuloperazine, Hal = Haloperidol, Chl=Chlopromazine, Ris = Risperidone, Ola = Olanzapine

patterns over the 5 years period. No definite pattern for prescriptions of parenteral antipsychotics (chlorpromazine, haloperidol, Flupenthixol, fluphenazinedepot) was seen in the period the research covered for both study sites. The daily number of persons who were prescribed trifluoperazine, haloperidol, chlorpromazine and olanzapine in each of the above mentioned years in FNPH showed difference with corresponding drug in UBTH which gave respective p-values of 0.004, 0.0166, 0.01 and 0.0173, (see Table 5)

The difference between the daily prescription of parenteral antipsychotic medications between FNPH and UBTH from 2013 to 2017 gave p-value of 0.0028 for haloperidol and 0.0003 forfluphenazine depot, (Table 6).

DISCUSSION

There were more males that participated in the study compared to female in both study health facilities; this may be due to the fact that more males are suffering from schizophrenia compared to females [11]. The highest average numbers of drugs per encounter was 2.804 at Federal Neuro-Psychiatric hospital, Benin City (FNPH) happened in 2017 while the lowest average number of drugs per encounter was 2.54 in 2014 in the same facility. This figure is almost the same with similar studydone in this setting [10], where the average drugs per encounter for previous 5 years (2007-2012) period of drug utilization study was 2.88. The prescriptions practices of physicians in University of Benin Teaching hospital, Benin City (UBTH) revealed highest

Table 4 : Drug utilization of parenteral antipsychotic medications

Year	Name & dose (mg)	DDD (mg)	FNPH				UBTH			
2013			N=514	DDD/1000/Day	% Pop	Actual Pop	N=386	DDD/1000/day	% Pop	Actual Pop
	Chl 50	0.1	8	0.02	0.002	0.010	9	0.03	0.003	0.01
	Hal 5	3.3	19	0.16	0.016	0.082	5	0.05	0.005	0.02
	Flu* 20	4	17	0.19	0.019	0.10	43	0.19	0.019	0.07
	Flu 25	1	151	20.1	2.01	10.79	94	16.79	1.679	6.48
2014			N=509				N=368			
	Chl 50	0.1	20	0.05	0.005	0.02	5	0.02	0.002	0.01
	Hal 5	3.3	14	0.12	0.012	0.06	2	0.03	0.003	0.01
	Flu* 20	4	37	0.13	0.013	0.07	64	0.33	0.033	0.12
	Flu 25	1	215	29.03	2.90	14.76	71	13.78	1.378	5.07
2015			N=519				N=362			
	Chl 50	0.1	62	0.18	0.018	0.09	23	0.09	0.009	0.03
	Hal 5	3.3	40	0.32	0.032	0.17	2	0.03	0.003	0.01
	Flu* 20	4	43	0.14	0.014	0.07	96	0.55	0.055	0.20
	Flu 25	1	162	21.35	2.135	11.08	109	24.7	2.47	8.94

KEY: FNPH = Federal Neuro-Psychiatric hospital, Benin City, UBTH = University of Benin Teaching hospital, Benin City, N= sample size for the year, Pop = population, Chl = Chlopromazine, Hal = Haloperidol, Flu* = Flupentixol, FLU = Fluphenazine

Table 4 Continued: Drug utilization of parenteral antipsychotic medications

Year	Name & dose (mg)	DDD (mg)	FNPH				UBTH			
2016			N=531				N=363			
	Chl 50	0.1	39	0.1	0.01	0.05	13	0.06	0.006	0.02
	Hal 5	3.3	30	0.23	0.023	0.12	4	0.05	0.005	0.02
	Flu* 20	4	58	0.19	0.019	0.10	46	0.26	0.026	0.10
	Flu 25	1	193	24.88	2.488	13.21	82	18.5	1.85	6.72
2017			N=508				N=378			
	Chl 50	0.1	6	0.02	0.002	0.01	7	0.03	0.003	0.01
	Hal 5	3.3	20	0.16	0.016	0.08	6	0.07	0.007	0.03
	Flu* 20	4	56	0.19	0.019	0.10	40	0.22	0.022	0.83
	Flu 25	1	204	27.64	2.764	14.04	72	15.49	1.549	5.86

KEY: FNPH = Federal Neuro-Psychiatric hospital, Benin City, UBTH = University of Benin Teaching hospital, Benin City, N= sample size for the year, Pop = population, Chl = Chlopromazine, Hal = Haloperidol, Flu* = Flupentixol, FLU = Fluphenazine

Table 5 : Comparison in actual population prescribed oral antipsychotic medications on daily basis between the settings

YEAR	DRUG	FNPH (Actual population)	UBTH (Actual population)
2013	Trifluoperazine	8.16	2.17
2014	Trifluoperazine	8.64	0.84
2015	Trifluoperazine	6.90	2.20
2016	Trifluoperazine	5.58	1.17
2017	Trifluoperazine	4.09	1.40
		P=0.004	
2013	Haloperidol	10.51	2.23
2014	Haloperidol	9.37	2.58
2015	Haloperidol	6.21	2.92
2016	Haloperidol	4.90	1.44
2017	Haloperidol	4.39	5.32
		P=0.0166	
2013	Chlorpromazine	8.36	3.37
2014	Chlorpromazine	7.30	2.10
2015	Chlorpromazine	5.47	5.63
2016	Chlorpromazine	5.74	3.19
2017	Chlorpromazine	4.82	2.31
		P=0.01	
2013	Risperidone	2.51	2.04
2014	Risperidone	2.67	1.60
2015	Risperidone	2.39	3.38
2016	Risperidone	4.14	2.41
2017	Risperidone	4.25	2.40
		P=0.1413	
2013	Olanzapine	3.17	3.12
2014	Olanzapine	5.43	2.05
2015	Olanzapine	6.12	4.48
2016	Olanzapine	7.15	3.98
2017	Olanzapine	6.75	2.52
		P=0.0173	

KEY: FNPH=Federal Neuro-Psychiatric hospital, Benin City,
UBTH= University of Benin Teaching hospital, Benin City, p-value at = 0.05.

Table 6 : Comparison in actual population prescribed parenteral antipsychotic medications on daily basis between the settings.

YEAR	DRUG	FNPH (Actual population)	UBTH (Actual population)
2013	Chlorpromazine	0.010	0.01
2014	Chlorpromazine	0.02	0.01
2015	Chlorpromazine	0.09	0.03
2016	Chlorpromazine	0.05	0.02
2017	Chlorpromazine	0.01	0.01
		P=0.2432	
2013	Haloperidol	0.082	0.02
2014	Haloperidol	0.06	0.01
2015	Haloperidol	0.17	0.01
2016	Haloperidol	0.12	0.02
2017	Haloperidol	0.08	0.03
		P=0.0028	
2013	Flupentixol	0.10	0.07
2014	Flupentixol	0.07	0.12
2015	Flupentixol	0.07	0.20
2016	Flupentixol	0.10	0.10
2017	Flupentixol	0.10	0.83
		P=0.2543	
2013	Fluphenazine	10.79	6.48
2014	Fluphenazine	14.76	5.07
2015	Fluphenazine	11.08	8.94
2016	Fluphenazine	13.21	6.72
2017	Fluphenazine	14.04	5.86
		P=0.0003	

KEY: FNPH=Federal Neuro-Psychiatric hospital, Benin City,
UBTH= University of Benin Teaching hospital, Benin City, P = P-value at =

figure for average encounter of drugs per prescriptions as 2.52 in 2016 with the lowest value of 2.32 seen in 2014. The values of average number of drugs per encounter for both study sites FNPH and UBTH are quite not different from each other. Similar value was seen in a study done [7]in Bayelsa state in southern Nigeria which gave a value of 2.94, in addition, a higher value of about 4 was reported in a research work [12] conducted in the northern part of Nigeria while in faraway India, a value as high as 3.396 was shown [13]. This is against the backdrop that WHO guidelines on rational drug use which recommends an optimal range of 1.6 1.8 drugs per encounter in these regions [5] in order to forestall polypharmacy which can lead to numerous adverse effects consequently negating the rational use of drugs.

More also the WHO indicator for rational drug use should be that 100% of medicines be prescribed in generic name. This feat was not achieved in both settings as the highest percentage (96.67%) of prescriptions prescribed in generic name was seen in 2016 at FNPH, while that of UBTH was 92.87 in 2014. This similar finding occurred in study done before our study in FNPH [10], where prescriptions prescribed in generic name still did not meet up to 100%. A much lower figure was seen in other part of Nigeria [7,12] and even outside the country[13] this indicator value is very important in achieving rational drug use with regards to cost of medications because prescribing in generic name gives the patient the choice to get the generic drug which is relatively cheaper than branded drug or even get the branded products if such individual can afford such item whereas prescribing in branded or innovator brand name leaves the individual with no alternative but to get only the prescribed brand which most times are more expensive than generic items hence physicians need to be reminded on the need to stick to achieving the optimal value of 100% prescription in generic name in order to achieve rational drug use..

It is worthy to note that in each of the year that was reviewed, both study sites met the WHO reference values of 20.0-26.8% with respect to percentage of antibiotics, and percentage of injection encounter with optimal range of 13.4-24.1%. This was in congruent with the percentage of antibiotic per encounter done in FNPH [10]. This indicator ensures that abuse of antibiotics is reduced to the barest minimum. The low percentage recorded may be due to the fact that attempt was being made to achieve rational prescribing in these hospitals as well as patient having mental or psychiatric condition may not require antibiotics as much as the general population. On the other hand, the WHO optimal was not attained in some studies in Nigeria [7,12] and other countries such as India [5], Nepal [5].

There was relatively higher percentage of drugs prescribed from essential drug list [8] in the centers where the data were collected compared to other studies done[7],[12] even though these value fell short of WHO reference value of 100%. Prescribing from essential drug list (EDL) ensures that the drug prescribed meet the need of the majority of the populace than just a few individuals who can still benefit from similar drug that is listed as essential drugs, as well as drugs listed on the EDL have proven to have established effectiveness than other who are not listed on the list eventually promoting rational prescribing [5,13,15].

Percentage of out of stock of drug range from 5-14% in FNPH, a similar range with that of UBTH, this to me is not a bad result, however efforts should be made to reduce the out of stock syndrome to a much lower level. This is not really one of the WHO performance indicators but reducing or eliminating out of stock of medication(s) promotes availability of drugs hence encouraging rational drug use [14].

The antipsychotic medications that was mostly prescribed in FNPH in 2013 and 2014 with respective values of 10.51 and 9.37 was oral dosage form of haloperidol which also was the mostly prescribed in 2007-2012 in the same health institution [10], however in 2015, olanzapine tablet became the mostly prescribed. In 2016 and 2017, there was a shift from typical antipsychotics to Olanzapine which is atypical antipsychotics. This trend of decline in the use of typical antipsychotics and increase in the prescription of atypical antipsychotics medicated was in agreement with another study [10]. In UBTH, prescriptions of antipsychotics did not follow any particular pattern as chlorpromazine was the mostly prescribed in the years reviewed except haloperidol tablet that was mostly prescribed in 2014 and oral olanzapine in 2016. Both facilities used in the study prescribed fluphenazine (depot) injection to more persons on daily basis than any other parenteral antipsychotic medications from 2013-2017.Comparative evaluation of the two health institutions used in the period of study revealed that for oral antipsychotic drugs with the exception of risperidone, differences occurred with the number of persons prescribed antipsychotics (haloperidol, trifluoperazine, chlorpromazine and olanzapine) when comparing prescribing practices of same drug in FNPH and UBTH, with the former health facility recording a higher values compared to the latter. This means that FNPH was giving to prescribing more oral antipsychotics than UBTH.

In addition, there was also relative difference between the two study institution in terms of prescription pattern of parenteral haloperidol and fluphenazine depot employed in the study with a lower daily number of individuals prescribed these medications recorded in UBTH in relation to same drugs in the other setting. This may be due to the fact that fewer numbers of persons get their psychiatric care from the former than FNPH.

This research work only took cognizance of outpatient prescriptions leaving out the prescriptions of those who were hospitalized during the period of study and exclusion of inpatients prescriptions may have altered the results of this study.

CONCLUSION

Comparing the prescribing indices in both setting with World Health Organization (WHO) prescribing indicators revealed that both health facilities gave higher average number of drugs per encounter, lesser percentage of medicines prescribed in generic name and prescribing drugs from essential drug list while the prescribing practices of these centers meet the WHO reference values for percentage of antibiotics, percentage of injection encounter. This mean that there should be need for more advocacy in alerting the physicians to these aspect, where prescribing did not get to the standard in order to promote rational prescribing in the nearest future.

The prescribing of typical antipsychotics in Federal Neuro-Psychiatric Hospital (FNPH) showed decline in the number of persons prescribed typical antipsychotics from 2013 to 2017, while the trend of typical antipsychotics had increased over the period of study with Olanzapine tablet being the mostly prescribed in 2016 to 2017. This finding of prescription pattern in FNPH is different in the prescribing practices of antipsychotics in University of Benin Teaching Hospital (UBTH) as there was no definite pattern during the study..

FNPH had more number of persons who were prescribed oral antipsychotic medications of trifluoperazine, chlorpromazine, haloperidol and olanzapine, parenteral haloperidol, parenteral fluphenazine when considering prescriptions of same drug name in both settings. This may be due to the fact that FNPH as at the time of study had more psychiatric patients than UBTH.

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