



Comparative Analysis of Psychotropic Drugs Prescribing Trends in Two Tertiary Health Institutions North West Nigeria: Investigating Compliance with WHO Core Drug Use Indicators in Health Facilities

Olayiwola Jimoh AG^{1*}, Toluwalase Bakare H¹ and Tomori Bakare AF²

¹Department of Pharmacology and Therapeutics, Usmanu Danfodiyo University Sokoto, Nigeria

²Department of Psychiatry, Usmanu Danfodiyo University Teaching Hospital Sokoto, Nigeria

Abstract

Introduction: The use of psychotropic medications is common as 7.2% of the world population take at least one of such medication. Inappropriate drug prescribing has become a global problem, making drug utilization studies absolutely imperative. Psychotropic drug utilization rates provide information regarding rational drug use and are useful in monitoring treatment for mental disorders on a population basis. The aim of this study therefore was to compare and analyze the pattern of psychotropic drugs prescription, compliance with WHO drug use standards and determine the frequently encountered non-psychotropic's in the psychiatry department of two tertiary health institutions North West Nigeria.

Method: This was a descriptive cross-sectional study. All patients attending the psychiatric outpatient clinic of the two hospitals from January 2014 to June 2014, diagnosed with psychiatric disorders and placed on at least one psychotropic drug were included in the study. The sample size was determined using single population proportion formula and 250 respondents were selected using systematic random sampling. Data was collected manually through proformas and analyzed using SPSS version 20.

Result: The average number of drugs per prescription in both institutions was more than 2.0 (2.55, 3.44), this index partly accounts for the exaggerated average total drug cost of more than US\$ 5 recorded in both hospitals. Carbamazepine (16.1%, 12.4%), amitriptyline (10.6%, 12.4%), haloperidol (10.2%, 7.7%) topped the list of prescribed psychotropics in both health institutions.

Conclusion: In both institutions, the findings trend towards irrational prescribing. Intervention on physicians prescribing habit from findings of monitoring system and related studies should be implemented to improve compliance and overall mental therapy outcome.

Keywords: Psychotropic drugs; WHO drug use indicators; Prescribing habits; Drug utilization studies; Psychiatrists

Introduction

Drug utilization study is one of the fundamental watchtowers of promoting rational use of medicine for treatment of various diseases, surveying the field of healthcare and leading to a greater understanding of the development that underlies it [1]. Drug Utilization Research (DUR) was defined by the WHO in 1977 as "the marketing, distribution, prescription, and use of drugs in a society, with special emphasis on the resulting medical, social and economic implications" [2]. Psychotropic medication use is common, with 7.2% of the world population taking at least one of such medication. These drugs are not frequently used to their full potential, or according to usually accepted criteria [3].

Irrational drug use leads to reduction in the quality of drug therapy, wastage of resources, increased treatment cost, increased risk of adverse drug reactions, and emergence of drug resistance [4]. Prescription errors have also been established as an important leading cause of patient mortality and morbidity in hospitals [5]. In the United States, prescription errors are estimated to harm at least 1.5 million patients per year [6]. The increased interest in DUR has resulted from recognition

OPEN ACCESS

*Correspondence:

Olayiwola Jimoh AG, Department of Pharmacology and Therapeutics, Usmanu Danfodiyo University Sokoto, (Teaching Hospital Complex), Nigeria, Tel: +234-8035950558;

E-mail: abdulgafarajimoh@gmail.com

Received Date: 27 Dec 2019

Accepted Date: 23 Jan 2020

Published Date: 27 Jan 2020

Citation:

Olayiwola Jimoh AG, Toluwalase Bakare H, Tomori Bakare AF. Comparative Analysis of Psychotropic Drugs Prescribing Trends in Two Tertiary Health Institutions North West Nigeria: Investigating Compliance with WHO Core Drug Use Indicators in Health Facilities. *Ann Pharmacol Pharm.* 2020; 5(2): 1177.

Copyright © 2020 Olayiwola Jimoh AG. This is an open access article distributed under the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

Table 1: Finding from WHO core drug use indicators in both health institutions.

WHO core drug use indicators	FNPBK	UDUTH	WHO standard
Prescribing indicators			
• Average number of drugs per prescription	2.55%	3.44	1.8 -2.0
• Percentage of drugs prescribed by generic name	42.80%	68.86%	100%
• Percentage of encounters with an antibiotic prescribed	1%	6%	20% to 26.8%
• Percentage of encounters with an injection prescribed	8%	14%	13.4% to 24.1%
• Percentage of drugs prescribed from national essential drug list	80.90%	66.20%	100%
Patient care indicators			
• Average consultation time (minutes)	8.1 min	20.12 min	30 min to 45 min
• Average dispensing time (seconds)	720 sec	820 sec	180 sec
• Percentage of drugs actually dispensed	99.60%	40.20%	100%
• Percentage of patients' knowledge on correct drug dosage	65.50%	70%	100%
Facility indicators			
• Availability of essential medicine list to practitioners	0%	0%	100%
• Availability of standard treatment guidelines	0%	0%	100%
• Availability of key drugs	100%	42%	100%
Complementary drug use indicators			
• Average drug cost per encounter	N 1158.97	N 3607.2	
• Percentage of drug cost spent on antibiotics	0.60%	5.94%	
• Percentage of drug cost spent on injections	5.50%	9.90%	
• Percentage of prescriptions in accordance with standard treatment guideline	86.90%	100%	
• Percentage of patients satisfied with the care they received	65.40%	66%	

of the virtual explosion in the marketing of new drugs, the wide variations in the patterns of drug prescribing and consumption, and the increasing concern about the cost of drugs [7].

The average number of drugs per prescription in an audit is an important index of the scope for review and intervention in prescribing practices. This is especially important in psychiatry as studies have shown that polypharmacy which increases the risk of drug interactions and errors of prescribing was common, and psychotherapeutic drugs have been over-prescribed and misused [8]. Rational Use of Drug (RUD) requires that patients acquire medications appropriate to their clinical needs, in doses that meet their own requirements, for an adequate period of time, and at lowest cost to them and their community [9].

A typical drug evaluation process aimed at encouragement of optimal drug use and the provision of high-quality drug therapy as cost-effectively as possible generally entails an in-depth analysis of a specific therapeutic group or groups [10]. The outcomes of these assessments often lead to improvements in cost-effective prescribing and better utilization of limited resources [11]. The aim of this study was therefore to compare and analyze the pattern of psychotropic drugs prescription & utilization in the psychiatric outpatient department of two tertiary health institutions North West Nigeria & assess compliance with WHO core drug use indicators in health facilities with a view to improving patient safety and the quality of medication use.

Methodology

The study was carried out in Sokoto, a cosmopolitan state North West Nigeria with high socio-economic disparity, at the psychiatric outpatient department of Usmanu Danfodiyo University Teaching

Hospital (UDUTH) & Federal Neuro-Psychiatric Hospital (FNPBK). It was a descriptive cross-sectional study conducted as a prospective assessment from January 2014 to June 2014. All patients attending the psychiatric outpatient clinic of the hospitals from January 2014 to June 2014, diagnosed with psychiatric or adjustment disorders and placed on at least one psychotropic drug were included in the study. All psychiatric in-patients were excluded from the study. Sample size for the study was calculated using the formula for descriptive study for populations less than 10,000 [12].

- Sample size $N = (z^2 Pq)/d^2$ = the SD set at 1.96 which corresponds to the 95% confidence level:

- p = prevalence rate which is 0.1

- $q = 1 - p$

- d = permissible error/degree of accuracy required, 0.04 $N = [1.96^2 \times 0.1 \times (1 - 0.1)] / 0.04^2 = 250$

This was divided into a corresponding ratio which was a function of the average number of patients Psychiatrists see daily in both hospitals. In UDUTH, psychiatrists consult an average of 20 patients daily and 80 in FNPBK. A systematic random sampling technique was used in selecting participants.

Thus, 20:80=1:4

A total of 250 data were collected in the ratio; $1/5 \times 250 = 50$ (from UDUTH) and $4/5 \times 250 = 200$ (from FNPBK).

Data collection was manual; the study evaluated primary and secondary data. Prescription details and WHO core drug use indicators for health facilities were assessed and recorded. The secondary data was entered into a pre-designed proforma while the

primary data was obtained from alternate consulting rooms through patient/patient's relative interaction, reviewing prescriptions and observing dispensers in order to evaluate patient care services. The core drug use indicators were evaluated using the standard prescribed formulas. The 17 points proforma is a scale validated by WHO is divided into 4 sections centered on: Prescribing, patient care, facility and complementary drug use indicators. Data obtained was entered into excel spreadsheets and analyzed using IBM SPSS version 20.0. It was then subjected to analysis for assessment of the descriptive statistics of: WHO-INRUD drug use indicators, prescribing errors and pattern of psychotropic drug utilization.

Result

Overall, a total of 250 participants were deployed for the study making the response rate 100%.

WHO core drug use indicators

In FNPHK the average number of drugs per prescription was 2.55 with an average total cost of N1158.97. Eight percent of injections were prescribed and these constituted majority of the cost. 42.8% of medications were prescribed by generic name and the average consultation time was 8.1 min. In UDUTH an average of 3.44 drugs per respondents' prescription was obtained with an average total drug cost of N3607.2. With an average consultation time of 20.12 min, the percentage encounter of antibiotics was 14% and 68.86% of the drugs were prescribed using generic names. Other indicators investigated are shown (Table 1).

Pattern of psychotropic drugs prescription and relevant non-psychotropics

The 200 prescription from FNPHK contained a total of 509 drugs with an upper limit of 6 drugs per prescription. Widely prescribed psychotropics were carbamazepine 16.1%, amitriptyline 10.6% and haloperidol 10.2% while benzhexol 15.5%, folic acid 11.6% and vitamin B 6.1% were the top prescribed non-psychotropic's as adjuncts to therapy. The findings at UDUTH followed a similar trend where the 50 prescriptions contained 169 drugs and 6 drugs per prescription being the maximum. Psychotropic's most encountered were carbamazepine and amitriptyline 12.4% each and haloperidol 7.7% while benzhexol 16.6%, vitamin B 11.8% and folic acid 8.9% for non-psychotropic's. Frequency of other psychotropic's and non-psychotropic are indicated (Table 2). Anti-psychotics and Anti-depressants were the most encountered class of psychotropics in both hospitals (Table 3).

Discussion

It is important to understand the choices that people make for treating mental illnesses to ensure proper utilization of available mental health services, and better management and control of mental disorders.

Prescription pattern analysis as per WHO drug use indicators

Prescribing indicators: The average number of drugs per prescription recorded in FNPHK (2.55) is comparable with results of Jordan (2.3), Brazil (2.4), and India (2.32) [13]. While the value obtained in UDUTH (3.44) is similar to previous study conducted in Nigeria (3.8) and Nepal (2.91) [14]. The variation in results could be due to difference in characteristics of health care delivery system, socioeconomic profile, morbidity and mortality characteristics in the population. Since WHO has recommended that average number of

Table 2: Prescribing frequency of psychotropic's and non-psychotropic's in both institutions.

DRUG	FNPHK Frequency (%)	UDUTH Frequency (%)
Amitriptyline	54 (10.6%)	21 (12.4%)
Amlodipine	-	2 (1.2%)
Augmentin	1 (0.2%)	-
Benzhexol	79 (15.5%)	28 (16.6%)
Carbamazepine	82 (16.1%)	21 (12.4%)
Chlorpromazine	11 (2.2%)	7 (4.1%)
Ciprofloxacin	-	3 (1.8%)
Coartem	4 (0.8%)	3 (1.8%)
Cognitol	6 (1.2%)	-
Diazepam	1 (0.2%)	-
Esomeprazole	1 (0.2%)	-
Flagyl	1 (0.2%)	-
Fluoxetine	4 (0.8%)	5 (3.0%)
Flupentixol	1 (0.2%)	-
Fluphenazine	22 (4.3%)	4 (2.4%)
Folic acid	59 (11.6%)	15 (8.9%)
Gestid	1 (0.2%)	-
Haloperidol	52 (10.2%)	13 (7.7%)
Ibuprofen	2 (0.4%)	-
Imipramine	4 (0.8%)	2 (1.2%)
Iron	-	1 (0.6%)
Moduretic	1 (0.2%)	4 (2.4%)
Multivite	1 (0.2%)	-
Neurovite	9 (1.8%)	-
Nifedipine	1 (0.2%)	1 (0.6%)
Olanzapine	10 (2.0%)	2 (1.2%)
Paracetamol	3 (0.6%)	-
Paroxetine	-	1 (0.6%)
Piriton	1 (0.2%)	-
Phenobarbitone	2 (0.4%)	-
Propranolol	20 (3.9%)	9 (5.3%)
Risperidone	5 (1.0%)	3 (1.8)
Sodium valporate	10 (2.0%)	-
Trifluphenazine	29 (5.7%)	-
Vitamin B	31 (6.1%)	20 (11.8%)
Vitamin C	-	4 (2.4%)
Vitamin E	1 (0.2%)	-
Total	509 (100%)	50 (100%)

drugs per prescription should be 2.0, the results of this study reflects polypharmacy which may lead to adverse drug reactions, decrease adherence to drug regimens, drug interactions, under-use of effective treatments, medication errors and unnecessary drug expenses [15]. The percentage of prescriptions with injections FNPHK (8%) and UDUTH (14%), are higher than studies in Nepal (3.1%, 5.2%), and India (0%), and similar to studies in Brazil (8.3%, 13.6%) [16-18]. Concerns about the adverse effects and cost-effectiveness of parenteral routes of drug administration, are probably the reason for

Table 3: Therapeutic classification of Psychotropic's and Non-Psychotropic's encountered.

Psychotropic's	FNPHK Frequency (%)	UDUTH Frequency (%)
Antidepressants	62 (12.2%)	24 (14.2%)
Antipsychotics	130 (25.5%)	34 (20.1%)
Anxiolytics	3 (0.6%)	21 (12.4)
Mood stabilizers	92 (18.1%)	-
Non- psychotropic's		
Anticholinergics	79 (15.5%)	28 (16.6%)
Multivitamins & supplements	107 (21%)	40 (23.7%)
Antihypertensives	22 (4.3%)	16 (9.5%)
Antiulcers	2 (0.4%)	-
Antibiotics	2 (0.4%)	3 (1.8%)
Analgesics	5 (1%)	-
Antihistamines	1 (0.2%)	-
Antimalarials	4 (0.8%)	3 (1.8%)
Total	509 (100%)	169 (100%)

the low utilization of depot injection formulation in the psychiatry outpatient departments. The rate of generic prescription was poor in this study. The use of generic names is recommended by WHO and regarded as an important factor for promoting RUD as it contributes to cost reduction. The primary purpose of adherence to essential medicine list is to promote rational use of medicines considering the three important aspects: cost, safety and efficacy [19].

Patient care indicators: The average dispensing time recorded was 720 and 820 sec respectively in FNPHK and UDUTH, this is higher than what is obtainable in all other previous studies; 52 sec Nepal, India 14.1 sec, Brazil 18.4 sec and Bangladesh 23 sec [20]. WHO recommends that the pharmacist should spend at least 180 sec in orienting each patient about the dosage regimen, any side effect of drug therapy and precautions to be taken after appropriate labeling of envelope [18]. The average consultation time was 8.1 min in UDUTH, this is lower than the 30 min to 45 min recommended to allow psychiatrists make medication adjustments, review potential medication interactions, consider impact of other medical disorders on patient's mental and emotional functioning, and counsel patients regarding changes they might make to facilitate healing and remission of symptoms such as exercise, cognitive therapy techniques, sleep hygiene.

Complementary drug use indicators: The average total cost per prescription N1158.97 (US\$ 7.11) in FNPHK and N3607.2 (US\$ 22.13) in UDUTH was higher than in Nepal (US\$ 3.73), India (US\$ 3.14) [13], and Pakistan (US\$ 2.26) [16,21]. Increase in drug cost can result from low generic or higher brand prescribing and higher average number of drugs per prescription. Although, research has been undertaken on medicine prices, so far there has been insufficient progress in improving medicine affordability and availability for individual patients in many countries. The cost of a prescription is an important variable in determining compliance especially in a developing country like Nigeria. Compliance must be taken into account in the interpretation of results of a given treatment especially in psychiatry because of the long duration of treatment and the high level of non-compliance [22].

Commonly prescribed psychotropic and non-psychotropic

drugs: We found the widely prescribed drugs in both hospitals to be the same in this study, although in slightly different order and to varying degrees. In FNPHK it was predominantly carbamazepine 13.6%, haloperidol 9.4% and amitriptyline 7.2%, while UDUTH recorded carbamazepine 15.6%, amitriptyline 12% & haloperidol 7.8%. In a similar study in India carbamazepine (17.2%) and amitriptyline (34.9%) topped the list. Tricyclic antidepressants remain the most frequently prescribed class of antidepressants and this is in consonance with other studies [23].

Non-psychotropic drug followed the same trend in both Hospitals. In FNPHK we had benzhexol (15.3%), Folic acid (11.59%), Vitamin B complex (5.89%), while for UDUTH it was benzhexol (5.5%), Vitamin B complex (3.54%) and Folic acid (2.95%). Although to a higher degree, this was obtainable in other studies and may be as a result of the role they play as adjuncts in psychiatric therapy one of which is curtailing extrapyramidal side effects of psychotropics. As far as drug utilization is concerned, unlike ours which encountered 6 drugs per prescription in both facilities, no previous study we could lay our hands on had a prescription with more than 5 drugs.

Conclusion

In both institutions, findings of this study show trends towards irrational prescribing having recorded an average number of drugs per prescription significantly higher than recommended by WHO and generic prescribing remarkably lower than the set standard. However, minimal antibiotics encounter is in line with WHO's postulate for countries where infectious diseases are endemic, and this could positively imply increased compliance, decreased drug resistance and adverse reactions and improved pharmacoeconomics.

Acknowledgement

The authors express profound gratitude to the respondents, psychiatrists and ethical committee of Federal Neuropsychiatry Hospital Kware and Usmanu Danfodiyo University Teaching Hospital.

References

1. WHO International Working Group for Drug Statistics Methodology. Introduction to drug utilization research. Geneva: WHO Collaborating Centre for Drug Utilization Research and Clinical Pharmacology; 2003.
2. Wittchen HU. Generalized anxiety disorder: prevalence, burden, and cost to society. *Depress Anxiety*. 2002;16(4):162-71.
3. McLachlan G. A Question of Quality? Roads to assurance in medical care. Oxford University Press; 1976.
4. Bharti SS, Shinde M, Nandeshwar S, Tiwari SC. Pattern of prescribing practices in the Madhya Pradesh, India. *Kathmandu Univ Med J*. 2008;6(1):55-9.
5. Leape LL, Kabacoff A, Berwick DM, Roessner J. Reducing Adverse Drug Events, Boston, MA. Institute for Healthcare Improvement. 1998.
6. Agrawal A. Medication errors: Prevention using information technology systems. *Br J Clin Pharmacol*. 2009;67(6):681-6.
7. Karande S, Sankhe P, Kulkarni M. Patterns of prescription and drug dispensing. *Indian J Pediatr*. 2005;72(2):117-21.
8. Shankar PR, Roy S. Patterns of prescription and drug use in psychiatry outpatient department in a teaching hospital in Western Nepal. *Internet J Pharmacol*. 2001;1(2).
9. Anacleto TA, Perini E, Rosa MB, César CC. Drug-dispensing errors in the hospital pharmacy. *Clinics (Sao Paulo)*. 2007;62(3):243-50.

10. WHO. The rational use of drugs. Report of a conference of experts Nairobi, 25-29 November 1985. Geneva: WHO; 1987.
11. Angalakuditi MV. Evaluation of pharmacist interventions on drug and dosage prescribing in pediatric settings. (Curtin University of Technology PhD Thesis). 2003.
12. Cochran WG. Sampling techniques, 2nd ed. New York: John Wiley and Sons Inc; 1963.
13. Mhetre NA, Bodhankar SL, Pandit VA, Zambare GN. Study of pattern of drug usage in an urban area. *Indian J Pharmacol.* 2003;35(5):316-7.
14. Hogerzeil HV, Bimo, Ross-Degnan D, Lang RO, Ofori-Adjei D, Santoso B, et al. Field tests for rational drug use in twelve developing countries. *Lancet.* 1993;342(8884):1408-10.
15. Sharif S, Al-Shaqra M, Hajjar H, Shamout A, Wess L. Patterns of drug prescribing in a hospital in Dubai, United Arab emirates. *Libyan J Med.* 2008;3(1):10-2.
16. Shankar PR, Pranab KS, Upadhyay DK, Dubey AK, Subish P. Drug utilization among surgical outpatients. *TMJ.* 2006;56:2-3.
17. Lahon K, Shetty H, Paramel A, Sharma G. A retrospective drug utilization study of antidepressants in the psychiatric unit of a tertiary care hospital. *J Clin Diagn Res.* 2011;5(5):1069-75.
18. Pereira JC, Baltan VT, Demello DL. National Health Innovation System: Relations between scientific fields are economic sectors. *Rev Saude Publica.* 2004;38(1):1-8.
19. National List of Essential Medicines of India. Ministry of Health and Family welfare. Government of India. 2011.
20. Sutharson L, Hariharan RS, Vamsadhara C. Drug utilization study in diabetology outpatient setting of a tertiary hospital. *Indian J Pharmacol.* 2003;35(4):237-40.
21. Alam K, Mishra P, Prabhu M, Shankar PR, Palaian S, Bhandari RB, et al. A study on rational drug prescribing and dispensing in outpatients in a tertiary care teaching hospital of Western Nepal. *Kathmandu Univ Med J.* 2006;4(4):436-43.
22. Olivier MR. Psychological factors, compliance and resistance to antidepressant treatment. *Encephale.* 1986;12:197-203.
23. Munizza C, Tibaldi G, Bollini P, Pirfo E, Punzo F, Gramaglia F. Prescription pattern of antidepressants in out-patient psychiatric practice. *Psychol Med.* 1995;25(4):771-78./d²