International Journal of Innovative Research and Advanced Studies (IJIRAS)
Volume 8 Issue 7, July 2021

ISSN: 2394-4404

Prescription Audit In The Rivers State University Teaching Hospital, Nigeria

Wonodi, Woroma

Onubogu, Uchenna C

Briggs, Datonye C

Department of Paediatrics, Rivers State University Teaching Hospital, Rivers State, Nigeria
Department of Paediatrics and Child Health, Faculty of Clinical Sciences, College of Health Sciences Rivers State University Nkpolu, Port Harcourt, Rivers State, Nigeria

Abstract:

Background: The prescription order is a legal document comprising instructions for medications by a licenced medical practitioner to a pharmacist and serves as a means of communication between the prescriber, dispenser and the consumer/patient. The aim of the study was to audit the patterns of prescription writing by doctors by accessing completeness in patient information, prescriber information and drug prescribing indicators according to the World Health Organization (WHO) standards.

Methods: This was a retrospective study of prescription order forms at the Rivers State University Teaching Hospital (RSUTH), from January 1st to June 30th 2020.

Result: A total of 1,170 prescriptions were evaluated. An average of 78.3% of all the needed information was written consisting of 60% of patient identifier information, 80.3% of drug identifier information and 94.6% of doctor identifier information. The mean number of drugs prescribed per patient encounter was 3.2±2 and only 43.2% of prescriptions contained generic names. The overall mean compliance to entry of drug identifier details from the prescriptions was 83.5% ± 0.71 while 5.3% of the writings were not legible.

Conclusion: The prescription quality among health workers was deficient in both patient information and prescribing indicators as recommended by the WHO standards. All cadre of doctors need to be sensitized about rational prescribing through training, routine assessments, monitoring and offering non-judgmental feedbacks. Regularly conducted prescription auditing can aid improved prescription quality as well as quality of patient care. There is a need to develop a standard prescription policy in RSUTH to help improve prescribing standards and minimize prescription errors.

Keywords: Prescription order, Audit, Rivers State University Teaching Hospital, Prescribing indicators

I. INTRODUCTION

The prescription order is a legal document comprising instructions for medications by a licensed medical practitioner to a pharmacist and serves as a means of communication between the prescriber, dispenser and the consumer/patient. It is usually written following a clinical diagnosis by a doctor. It is a clinical art as well as a skill acquired through training.

It is the ethical and legal duty of the medical practitioner to write complete and legible prescriptions[1]. The content and design of prescription orders differ from country to country and from one facility to another according to their needs but

essentially contain the patient information, the drug information and details about the prescriber. Some facilities include details about the dispenser or pharmacist. The patient's demographic details are important to ensure the right patient receives the right medicines, for medico-legal purposes and for record-keeping purposes. The drug information is supposed to be according to the World Health Organization's standard to include the drug name in generic, dosage, route of administration, duration of treatment.[2] The prescriber's details validates the prescription and authenticates the pharmacist to dispense the drugs while the pharmacist's details when included, validates the dispensed drugs and is important for medico-legal purposes and accountability. The benefit of using generic name is that it gives flexibility to the dispensing pharmacist hence he is not limited to a particular brand which may be more expensive.

To investigate the rational use of drugs (that is patients receiving the appropriate medicines, in doses that meet their own individual requirements, for an adequate period of time, and at the lowest cost both to them and the community), the WHO in collaboration with the International Network for Rational Use of Drugs developed a set of "core drug use indicators," an objective measure that can describe the drug use situation in a country, region, or individual health facility.[3] The indicators measure performance in three related areas of prescribing practices, patient care, and facility-specific factors.[3] Prescribing indicators include the number of drugs prescribing per encounter, the percentage of drugs prescribed by generic name, the percentage of encounter by injection and antibiotics prescription, and the percentage of drugs prescribed from essential drug list (EDL).

The WHO proposes that optimally, the number of drugs prescribed per encounter should be two or less[3] as polypharmacy not only increases health cost for patient and government but the risk of adverse drug reactions. All prescribed drugs should be 100% generic (international non-proprietary name) according to the WHO in order to reduce cost and avoid confusing patients and dispensing pharmacists.[3] The WHO indicates that optimally the percentage of antibiotic encounters should be less than 30% while the percentage of encounters with an injection prescribed should be less than 20%. Finally, all drugs should be prescribed from the essential drug list (EDL).[3]

An audit is an on-site verification activity of a process or quality system which measures existing practices against a defined standard and highlights the discrepancies between actual practices and recommended standards. Prescription auditing, if done regularly can aid in improving the prescription quality and thus enable the patients to receive high standard and best quality care.[4] Lack of regular drug auditing and feedback after the process is said to be one primary cause of medication errors of omission (prescriptions missing essential information) or commission (wrongly written information on the prescription)[5,6] which may lead to unnecessary expenditure by the patients.

The WHO has reported that around 50% of all medicines are inappropriately prescribed, dispensed, or sold.[7] In Nepal only about 68-78% of prescriptions were completely filled[8] while Erhun et al reported that, while 85.9% of prescriptions were completely filled in the health centre only 1.3% of same were completely filled in the teaching hospital.[9] Different prescription audits have been conducted in different facilities globally and even in Nigeria but none has been conducted in RSUTH hence the need for this research. The data from this research may provide a benchmark for reference and comparable data in the future.

This study was conducted in the outpatient department (OPD) pharmacies of the RSUTH to investigate the rational use of drugs for completeness, legibility, and against the WHO-recommended core drug use indicators as a way of improving prescription standards, training and retraining of health care providers, sensitization on rational drug prescription, monitoring, evaluating and possibly suggesting modifications in prescription practices to ultimately build safer systems.

AIM

The aim of the study was to audit the pattern of prescription writing by doctors in RSUTH in terms of completeness of identifier information of patients and prescribers; and prescribing indicators according to WHO standards from January 1st 2020 to June 30th 2020.

II. MATERIALS AND METHODS

This cross-sectional retrospective study of prescription order forms was carried out on randomly selected prescriptions submitted to the outpatient pharmacies of the Rivers State University Teaching Hospital (RSUTH), from January 1st to June 30th 2020, a 6-month period. The RSUTH is a State-owned tertiary health facility located in the Southern part of Nigeria. The facility manages patients from within and outside the State and is a referral centre for private and other government facilities.

Prescription orders are hand written and emanate from the different departments in the hospital namely Paediatrics, Internal Medicine, Obstetrics and Gynaecology, Surgery, Dentistry, Ophthalmology, Otorhinolaryngology (ENT), and Family Medicine. Outpatient pharmacies in the facility are the Paediatrics, Obstetrics and Gynaecology, General outpatient and the combined Ophthalmology/ENT pharmacies. The RSUTH pharmacy order forms are usually in triplicate for the patient, pharmacy and the accounts department. The pharmacy copies are stored in the pharmacy department and easily accessible for use.

Ethical approval for the study was obtained from the Research Ethics Committee of the RSUTH (RSUTH/REC/2020032) and permission to assess the prescription order forms gotten from the Head of the department of Pharmacy. Complete confidentiality of the patients, doctors and pharmacists was maintained.

III. DATA ANALYSIS

Data collected was entered into excel spread sheet and analysed for completeness of information using the IBM Statistical Package for Social Sciences (SPSS) version 24.

Patient's name, hospital/folder number, age, sex and weight were grouped as patient identifier information and entering of each information was given 1 point making a total of 5 points. The drug identifier and instruction information consisted of the drug name, route of administration, dosage of the drug and duration and each component filled out was given 1 point making a total of 4 points. The prescriber identifier information included name of prescriber, signature and legibility of writing, each was scored 1 point, giving a total of 3 points for each filed section.

The overall points include the above stated information and prescription origin identifiers like department and date (2 points). A maximum overall score of 14 points was given for all filled sections, 0 point was given when a section was not filled. Each section score was expressed as a percentage of the maximum mark.

International nonproprietary drug names or Generic drug names were identified using drug formularies.

Drugs were classified as antibiotics according to the WHO classification[3] and they include penicillin, other antibacterial, dermatologic anti- infective agents and ophthalmologic anti-infective agents.

Continuous variables were expressed as mean and standard deviation, while discrete variables were expressed as frequencies and percentages. Chi square for trend was done to test for associations for ordered categorical variables. P value was set at 0.05 for level of significance.

IV. RESULTS

A total of 1,170 prescriptions were evaluated. Most prescriptions evaluated came from internal medicine 188(16.1%), followed by Ophthalmology 189(16.2%) and Surgery 145(12.4%). Majority of the prescriptions were dated 1120(95.7%), had a documentation of its originating department 943(80.6%) and did not have the patient's hospital/folder number, 1068(91.3%). Patient's gender, age and weight were written in 1011(86.4%), 484 (41.4%) and 62(5.3%) respectively. Only 21(1.8%) had ≥ 90% properly filled patient identifier information while majority 456(39%) filled only <70 -60% of the patient identifier information. The mean number of drugs prescribed per patient encounter was 3.2±2. The prescribing doctor's name was written in 1104(94.4%) while a doctor's signature was seen in 1109(94.8%). Sixty-two (5.3%) of the hand writing on the prescriptions were not legible, Table 1.

Description	Frequency n=1170(%)
Date written by Prescribing Physician	
Yes	1120(95.7)
No	50(4.3)
Documentation of origin of Department from which prescription was written	
Not written	227(19.4)
Prescription origin documented :	943(80.6)
Internal Medicine	188(16.1)
Ophthalmology	189(16.2)
Surgery	145(12.4)
ENT	114(9.7)
Family Medicine	108(9.2)
Paediatrics	105(9.0)
Obstetrics and Gynecology	63(5.4)
Dentistry	31(2.6)
Patient's hospital number written	
Yes	102(8.7)
No	1068(91.3)
Gender written	
Yes	1011(86.4)
No	159(13.6)
Age written	
Yes	484(41.4)
No	686(58.6)
Weight written	
Yes	62(5.3)
No	1108(94.7)
Patient identifier score	
<50	83(7.1)
<60- 50	170(14.5)
<70 -60	456(39.0)
<80 – 70	358(30.6)
<90 -80	82(7.0)
90 -100	21(1.8)
Number of drugs prescribed for each patient encounter	
1	236(20.2)
2	242(20.7)
3	253(21.6)
4	162(13.8)
5	118(10.1)
6	74(6.3)
7	42(3.6)
8	29(2.5)
9	13(1.1)
≥10	1(0.1)
Doctors' name written	
Yes	1104(94.4)
No	66(5.6)
Doctors' signature	
Yes	1109(94.8)
No	61(5.2)
Legibility of writing on prescription	
Yes	1108(94.7)
No	62(5.3)

Table 1: characteristics of prescriptions

A total of 3,802 drugs were prescribed and generic names was used in 1641(43.2%), while 612(16.1%) of those drugs were antibiotics, the route of administration was written in 3639(95.7%), dosage in 3715(97.7%) and duration of administration in 3705(97.4%).The overall mean compliance to entry of drug identifier details from the prescriptions was 83.5% ± 0.71(Table 2). Prescribing a 5th drug increased the odds of using a generic name when prescribing (OR: 2.2) while prescribing an 8th, 9th or 6th drug decreased the odds of using a generic name. The first drug prescribed had an equal likelihood of being an antibiotic (1.0) while the 2nd to 10th

prescription had a decreased likelihood of being an antibiotic (0.72 to 0.42)

Drug position on prescription	Num. N	Frequency of Generic name use (OR)	Antibiotic frequency n (%)	Specification of route of administration n(%)	Dosage specification n(%)	Duration of use specified n(%)	Drug identifier and instruction compliance Mean score (SD)
Drug 1	1170	451(1.0)	232(1.0)	1124(1.0)	1139(1.0)	1134(1.18)	82.2 ± 17.3
Drug 2	931	376(1.08)	168(0.89)	886(0.8)	909(1.12)	909(1.31)	82.7 ± 17.4
Drug 3	687	309(1.3)	104(0.72)	660(1.0)	670(1.07)	669(1.18)	83.9 ± 17.9
Drug 4	438	224(1.6)	40(0.40)	419(0.9)	429(1.29)	427(1.23)	85.5 ± 17.6
Drug 5	271	157(2.2)	31(0.52)	260(0.96)	268(2.43)	266(1.68)	87.7 ± 15.9
Drug 6	161	62(0.99)	15(0.41)	154(0.90)	159(2.16)	159(2.52)	82.9 ± 14.9
Drug 7	85	43(1.6)	15(0.86)	79(0.53)	82(0.74)	82(0.86)	84.1 ± 18.4
Drug 8	44	14(0.74)	4(0.40)	43(1.76)	44(-)	44(-)	82.3 ± 12.7
Drug 9	14	4(0.15)	2(0.67)	13(0.53)	14(-)	14(-)	80.3 ± 14.4
Drug≥ 10	1	1(-)	1(-)	1(-)	1(-)	1(-)	
Total (%)	**3802**	**1641(43.2)**	**612(16.1)**	**3639(95.7)**	**3715(97.7)**	**3705(97.4)**	**83.5 ± 0.71**
P		0.001	0.00001	0.69	0.125	0.14	

Table 2: Characteristics of the drug identifier and instructions of physicians' prescriptions RSUTH

Overall, evaluation of 1,170 prescriptions given for each patient encounter showed that it contained an average of 78.3% of all the needed information required for a good quality prescription with 60% of patient identifier information, 80.3% of drug identifier information and 94.6% of doctor identifier information. Prescriptions from department of Paediatrics had the highest patient identification information score at 74.2%, followed by department of dentistry at 67.3%. The department that entered the highest drug identifier information was internal medicine at 84.1% followed by Obstetrics and gynecology at 83.1%. Prescriber identifier information was highest among prescriptions from ENT department at 99.4%, followed by internal medicine at 98%.

Antibiotic prescription per patient encounter was highest in the department of Dentistry at 96.8%, followed by Paediatrics at 63.8%, Ophthalmology department had the least antibiotic prescription per patient encounter. The departments that prescribed the highest mean number of drugs per patient encounter are internal medicine, ENT, Obstetrics and Gynaecology at 4 drugs per patient see table 3. Overall, the department that entered the highest number of information required for a good quality prescription was department of Paediatrics at 82.8%, followed by Internal Medicine at 82.5%.

Department	N	Patient identifier score(%)	Drug identifier score(%)	Mean nos of drug per encounter	Antibiotic prescribed per patient encounter (%)	Doctor identifier score (%)	Prescription Quality total score (%)
Paediatrics	105	74.2	81.6	3(2, 3)	63.8	92.7	82.8
Internal Medicine	188	64.9	84.8	4(4, 5)	22.0	98.0	82.5
Family Medicine	108	67.1	81.6	3(3, 4)	22.2	97.8	82.2
ENT	114	64.2	79.5	4(3, 4)	43.9	99.4	81.0
Obstetrics and Gynecology	63	66.2	83.5	4(3,4)	47.6	93.1	80.9
Dentistry	31	67.3	75.3	3(3,3)	96.8	97.8	80.2
Ophthalmology	189	57.1	81.5	2(2,3)	19.0	96.1	78.2
Surgery	145	63.1	71.6	3(2, 3)	34.5	85.5	73.4
Section not written	227	41.6	80.4	3(3,4)	34.4	93.2	71.7
Overall mean	**1170**	**60.0**	**80.3**	**3(3,3)**	**34.9**	**94.6**	**78.3**

Table 3: Comparison of quality of prescription according to department of origin

V. DISCUSSION

Overall, our findings revealed that prescription quality among health workers in all the outpatient pharmacies of the RSUTH was deficient in both patient information and prescribing indicators as recommended by WHO standards. The overall quality of prescribing pattern was worse with patient identifier information. Our finding that prescriptions were deficient in patient's hospital number in 91.3%, gender in 13.6%, age in 58.6% and weight in 94.7% of prescriptions, were very worrisome. Although the Department of Paediatrics was found to have the highest patient identifier score when compared to other departments, it was far below the WHO prescription standards. The parameters were possibly higher because identifiers like weight and age are more important to ensure appropriate medication prescription in children. Inappropriately filled patient information can unintentionally lead to medication errors including mix-ups and inappropriate dosing.

As regards prescriber information, our findings showed that 5.6% of prescriptions were deficient in the prescribers' name and 5.2% the prescriber signature. The possible reason for this relatively high proportion of missing prescriber information in this study is that in RSUTH, attending doctors have to manually enter names and other personal identifiers for every patient consultation and at times due to the high daily patient load at the out-patient clinics, skipping such identifiers may be an unintended error of omission. Although it has been suggested that the prescriber's name, phone number and address be pre-printed on the prescription sheet by WHO, this is not the case in our settings. It is plausible that physician fatigue following repeated static biodata writing can cause loss of interest, making a case for electronic tags and the need to embrace electronic record keeping. Besides, the number of patients that can be seen in most outpatient clinics are not capped, with high patient to physician ratio in Nigeria of 10,000 to 4[10] most outpatient clinics have a high patient load with very few doctors and the physician is usually under pressure to see many patients time frame to the extent that they are tempted to cut off writing certain information in order to save time and meet up consultation needs.[11] Notwithstanding, our finding that over 90% of audited prescriptions had the names and signature of the prescriber compared favourably to the 54.0%, 70% and 83.3% reported in earlier Nigerian studies that included both public and private hospitals.[12,13]

In this study involving 1170 prescriptions, the average number of drugs prescribed per encounter was found to be higher than the optimal figure of less than 2 drugs per encounter recommended by WHO. Our findings were similar to the 3.02 and 3.16 drugs per encounter reported by similar studies conducted in a tertiary facilities in Nigeria.[12, 13] It was however lower when compared to that of a Nigerian study by Babalola et al, conducted among primary health centres where 6.11 drugs per encounter were prescribed.[14] Different to the findings of our study, were studies conducted among non-

tertiary facilities in other developing countries like Sudan, Zimbabwe and Palestine which reported a mean number of drugs per encounter to range between 1.3 and 1.4 [16]

We found that 4.3% of prescriptions did not include the route of administration, 2.3% did not include the dosage of the drugs and 2.6% of prescriptions did not indicate the duration of administration. These would most likely leave the dispensing pharmacist to use intuition or personal discretion which may not eventually be in the best interest of the patient since the precise pharmacokinetic and pharmacodynamic properties of the prescribed medications may differ depending on the patient's underlying clinical diagnosis. Our findings were higher than those reported in an Indian study by Farnoud et al[19], who found that 0.4% of prescriptions did not include the strength of the medication, 0.1% of prescriptions did not include the dose units and 0.3% did not include the quantity of medications. Authors in that study proposed that in their settings, the aforementioned parameters were left to the individual dispensing pharmacist to decide.

The WHO recommends the generic name be used for prescription medications at all times.[2,3,18] It considers it as a safety precaution for both patients and health care providers because it allows for clear identification, eases information exchange and promotes better communication between health care providers. Our finding that only 43.2% of prescriptions contained generic names was similar to findings of 42.7% in another tertiary facility in Nigeria[15] and contrasts findings in a study conducted among non-tertiary facilities in Ghana by Apanga et al[20], with an almost 100% prescription in generic names. Authors attributed the optimal compliance in their study to the fact that the National Health Insurance Scheme only refunded facilities where drugs were prescribed in their generic names. But, in India, Farnoud et al[19] reported that 90.1% of prescriptions in their tertiary facility contained generic names. The authors attributed their findings to the possible flexibility it offers the dispensing pharmacist and the opportunity of enabling patients to purchase prescribed medications that are cheaper and also effective. The much lower proportion observed in our study could suggests that the use of generic names is more habitual rather than being based on either a predefined standard policy or the number of medications prescribed, as there really was no identifiable pattern. Furthermore, other plausible explanations for our findings include the prescribing doctors' experience with the branded product or occasionally the patients' preference for 'branded' products, the fear/ lack of confidence in the quality of 'unbranded-generic' product if not otherwise specified and, prescribers' decisions being influenced by extensive promotional activities of pharmaceutical company representatives.

The average percentage of prescription encounters containing antibiotics in our study was 34.9%. Although this is still higher than the WHO reference value of less than 30%, was similar to the 34.4% reported in a similar study conducted in tertiary facility in northern Nigeria[15] but was much lower than the average values of 50.15% reported in other earlier Nigerian studies conducted in non-tertiary facilities.[13,20] Our finding also compares favourably with the average values reported in previous studies conducted in non-tertiary facilities from other developing countries like Malawi (34%), Tanzania (39%) and Indonesia (43.1%).[21,22] In this situation, it is difficult to judge whether antibiotics were prescribed irrationally as it may be due to a difference in the patient population in terms of age, diseases and the fact that our centre is a tertiary referral centre with sicker patients. Our findings notwithstanding, showed that there was a higher frequency of prescribing an antibiotic by the first two drugs but was also noticed even after the fifth medication. Polypharmacy increases the likelihood of prescribing redundant medications. If the physician has already prescribed the most relevant active agent, which is usually reflected in the first two drugs prescribed, it would be worth evaluating the content of medications prescribed after the 2nd medication. This study demonstrates a trend towards over-prescribing of antibiotics and should be put in check. Overuse and misuse of antibiotics are a threat to the health of the populace and can increase the occurrence of antibiotic resistance.

This study also showed that 5.3% of prescriptions were poorly written and so illegible. Our findings compared favourably with other studies where poor handwriting was similarly reported to range from 7.1% to as high as 15%.[17,23,24,25] Despite the lower proportion of illegible prescriptions noted in our study, it is pertinent to highlight that poor handwriting is a serious problem that can lead to dispensing errors. These may ultimately cause harm to the patient with often serious or even life-threatening consequences.[26] Also, prescriptions with either missing vital information or wrongly written information could be interpreted incorrectly and also lead to unwanted spending by the patients who often pay out-of-pocket in our hospital.

The strength of our study lies in the fact that we included prescriptions originating from all the out-patient clinics with a wide range of general illness encounters, thus representing a good mix of health problems and ages in the RSUTH. However, our study was limited by its retrospective nature. Key data elements such as whether a drug was dispensed as prescribed including being done in the right formulation, dose, frequency and duration, may not have been recorded or were of uncertain accuracy. Nonetheless, our medical record system in RSUTH was able to provide the necessary essential elements of prescriptions within an identifiable time frame, name and route of all drugs prescribed making this retrospective sample have a less chance of bias.

In conclusion, our study depicts that overall, Paediatrics, Internal Medicine and Family Medicine departments had the highest prescription quality. Whereas, Dentistry, Paediatrics and O&G departments were the highest prescribers of antibiotics which may be a reflection of the prominence of infective or inflammatory diseases among out-patient attendees in their clinics. All departments, unfortunately, fell short of the recommended WHO prescription standards. There is an urgent need to sensitize prescribers – all cadre of doctors, about rational prescribing via training, assessment of prescribers, monitoring and offering non-judgmental feedbacks. This will help in attaining the WHO targets for prescribing in RSUTH to improve optimal utilization of scarce resources and prevent adverse health consequences of medication prescription errors.

REFERENCES

[1] Singh T, Banerjee B, Garg S, and Sharma S. A prescription audit using the World Health Organization-recommended core drug use indicators in a rural hospital of Delhi. J Educ Health Promot. 2019; 8: 37.
[2] WHO. Model list of essential drugs. Geneva: World Health Organization, (1988)
[3] World Health Organization. How to Investigate Drug Use in Health Facilities: Selected Drug Use Indicators – EDM Research Series No 007. 1993. [Last accessed on 2021 Jan 05]. Available from: http://www.apps.who.int/medicinedocs/en/d/Js2289e/
[4] National Institute for Clinical Excellence (NICE): Principles for Best Practice in Clinical Audit. Oxford: Radcliffe Publishing 2002
[5] Shrestha R, Prajapati S. Assessment of prescription pattern and prescription error in outpatient department at Tertiary Care District Hospital, Central Nepal. Journal of Pharmaceutical policy and practice 2019
[6] Ross S, Ryan C, Duncan EM, Francis JJ, Johnston M, Ker JS et al. Perceived causes of prescribing errors by junior doctors in hospital inpatients. A study from the PROJECT programme. BMJ Qual Saf 2013: 22:97.
[7] World Health Organization. The World Medicines Situation. World Health Organization. Available from: http://www. apps.who.int/medicinedocs/en/d/Js6160e/. Accessed on Jan 25, 2021.
[8] Nkera-Gutabara JG, Ragaven LB. Adherence to prescription-writing guidelines for outpatients in Southern Gauteng district hospitals. Afr J Prim Health Care Fam Med. 2020 Jun 15;12(1):e1-e11.
[9] Erhun WO, Adekoya OA, Erhun MO. Legal issues in prescription writing: a study of two health institutions in Nigeria. International Journal of Pharmacy Practice 2009;17:189-193.
[10] The World Bank. https://data.worldbank.org/indicato/SH.MED.PHY.ZS?locations=NG Accessed 31/05/2021.
[11] Wonodi W, Jaja ID, Ogolodom MP, Mbaba AN, Alazigha N. (2021). Evaluation of Reasons for Non-complete Filling of Investigation Request Forms by Medical Doctors in Rivers State, Nigeria. Crit Care Obst Gyne vol.7 No 3:31.
[12] Animasahun BA, Adekunle MO, Kusimo OY. An Audit of Selected Prescriptions Written at the Lagos State University Teaching Hospital. JAMMR. 2018. 28:1-10
[13] Akoria OA, Isah AO. Prescription writing in public and private hospitals in Benin City, Nigeria: The effects of an educational intervention. Can J Clin Pharmacol.2008; 15(2):e295-305.
[14] Babalola CP, Awoleye SA, Akinyemi JO, Kotila OA: Evaluation of prescription pattern in Osun State (Southwest) Nigeria. Journal of Public Health and Epidemiology 2011; 3:94-98
[15] Chukwuani CM, Onifade M, Sumonu K (2002). Survey of drug use practices and antibiotic prescribing pattern at a General Hospital in Nigeria. Pharm. WorldSci., 24 (5): 185-195.
[16] Nwolisa CE, Erinaugba EU, Ofolata SI (2006). Prescribing practices of doctors attending to under-fives in a children's outpatient clinic in Owerri. Epub 2005 Dec. 9. J. Tropical. Pediatr., 52 (3): 197-200.
[17] Tamuno I, Fadare JO: Drug Prescription Pattern in a Nigerian Tertiary Hospital. Tropical Journal of Pharmaceutical Research 2012; 11 (1): 146-152.
[18] Atifet M, Sarwar RM, Azeem M, Naz M, Amir S, Nazir K. Assessment of core drug use indicators using WHO/INRUD methodology at primary healthcare centers in Bahawalpur, PakistanBMC Health Services Research (2016) 16:684 DOI 10.1186/s12913-016-1932-2
[19] Farnoud GM, Shekar HS. Audit of Prescriptions in a Tertiary Care Hospital- a Retrospective Study, World Journal of Pharmacy and Pharmaceutical Sciences, 2016; 5(10): 886-894.
[20] Apanga S, Chirawurah D, Kudiabor C, Adda J, Adoesom JA and Punguyire D: Evaluation of drug prescribing pattern under the national health insurance scheme in rural Ghana. Int J Pharm Sci Res 2014; 5(6): 2193-98.
[21] Harvard Medical School and Harvard Pilgrim Health, World Health Organization. Using indicators to measure country pharmaceutical situations Fact Book on WHO Level I and Level II monitoring indicators, edn. Geneva: World Health Organization; 2006.
[22] Odunsanya OO. Drug use indicators at secondary health care facility in Lagos, Nigeria. J. Commun. Med. Health Care. 2004; 16 (1): 21-24.
[23] Slobodan MJ, Ljiljana MV, Milan RM, Vojislav BC, Irena RK, Zoran NK. An analysis of drug use indicators in primary care health facilities operating in the city of Kragujevac. Prescribing activities in the community in Kragujevac Serbia, 2006; (16): 1-16 http: /www.priory.com/farm/kosofo.htm.
[24] Massele AY, Nsimbi SED, Rimoy G. Prescribing habits in church-owned primary health care facilities in Dar ES Salaam and other Tanzanian Coast regions. East. Afr. Med. J., 2001; 78 (10): 510-514.
[25] Balbaid OM, Al-Dawood KM. Assessment of physician's prescribing practices at Ministry of Health Hospitals in Jeddah City, Saudi Arabia. Saudi medical journal, 1998;19:28-35
[26] Makonnen E, Yoseph M, Berhane Y. Quality of prescription at a tertiary care pharmacy in Addis Ababa. Ethiopian medical journal, 2002;40:233-9.
[27] Meyer TA. Improving the quality of the order-writing process for inpatient orders and outpatient prescriptions. American journal of health-system pharmacy, 2000; 57(Suppl. 4):18-2
[28] Charatan F. Family compensated for death after illegible prescription. British medical journal, 1999; 319:1456.9:1456.