ejpmr, 2016,3(3), 463-469

SJIF Impact Factor 3.628

EUROPEAN JOURNAL OF PHARMACEUTICAL AND MEDICAL RESEARCH

www.ejpmr.com

Research Article

ISSN 3294-3211

EJPMR

ANALYSIS OF PRESCRIBING TRENDS AT TERTIARY CARE TEACHING HOSPITAL OF CENTRAL INDIA

Dr. Shraddha N. Tatkare[1]*, Dr. Nilesh Tatkare[2], Dr. Kiran Giri[3], Dr. Sangeeta Totade[4]

[1,2]MD, Assistant Professor, K. J. Somaiya Medical College, Mumbai.
[3]MD, Assistant Professor, IMS, BHU, Varanasi.
[4]MD, Professor, J. N. Medical College, Wardha.

***Correspondence for Author: Dr. Shraddha N. Tatkare**
MD, Assistant Professor, K. J. Somaiya Medical College, Mumbai.

Article Received on 12/01/2016 **Article Revised on 02/02/2016** **Article Accepted on 22/02/2016**

ABSTRACT

Background: Proper prescribing habits and rational use of medicines can play a significant role in ensuring quality care at different levels of healthcare facilities. Prescribing patterns need to be evaluated periodically to increase the therapeutic efficacy, decrease adverse effects and provide feedback to prescribers. Objectives: the objectives were to evaluate prescribing patterns using drug use indicators and obtain information on the demographic characteristics of patients attending hospital. Methods: information regarding demographic, economic, diagnostic and treatment details was collected from the 800 prescriptions during the study period of april 2010 to july 2011. The prescriptions were analyzed for format adequacy; use of generics, injections and polypharmacy; incidence and rationality of fixed dose combinations (fdcs); common drugs prescribed; and socio-economic status of the patients. Results: format adequacy of the prescriptions was only 50%. Polypharmacy was common (2.38 drugs per prescription). The use of generics, injections and fdcs was 8%, 5% and 63.3%, respectively. Irrational drug combinations were used in a many instances. Analgesic and antibiotic use was common along all the opds. The average monthly per capita income of the patients attending this hospital was ₹1579 only. Conclusion: this study reveals that the prescriptions were poor in terms of completeness and rationality and there is considerable scope for improving the prescribing pattern. Adherence to standard treatment guidelines during prescription writing and periodic monitoring of institutional drug policy will help to improve health care delivery at affordable prices.

KEY WORDS: Prescription pattern, Rationality, Polypharmacy, Fixed dose combinations.

INTRODUCTION

As a result of continuing medical research work, there is a rapid change in the prescription patterns of the diseases, today. Irrational and inappropriate use of drugs is a major concern in both developed and developing countries.[1] Although drug utilization varies considerably from place to place, the basic elements of a prescription remain fairly same everywhere; which include details of the patient, diagnosis, details of drug, date and signature of the prescriber.[2] The inadequacy of the prescriptions in fulfilling these criteria is well known in today's medical practice. It is almost mandatory by the World Health Organization (WHO) for all the countries, to establish essential drug list and to follow the accurate prescription guidelines in view of Rational Use of Medicines. Despite all these efforts; the evidence of inappropriate prescribing habits like polypharmacy and use of irrational fixed dose combinations is prevalent resulting in adverse drug reactions, treatment failures and economic losses.[3]

A lot of awareness is being created in medical field by conducting prescription audits, arranging seminars and CMEs on Rational use of Medicines to improve the prescription writing practices. Academic detailing has been successful in increasing the clinicians' adherence to any guidelines and assists policy makers in improvisation.

AIM

To analyze the prescribing trends at a tertiary care teaching hospital

OBJECTIVES

1. To find out format adequacy of the prescriptions
2. To assess the socio-economical background of patients attending various outpatient departments (OPDs)
3. To assess the trends of polypharmacy
4. To assess the incidence and rationality of fixed drug combinations (FDCs)
5. To study drug utilization pattern in various OPDs

MATERIALS AND METHOD

A prospective cross-sectional study was carried out at a tertiary care rural teaching hospital i.e. Acharya Vinoba

Bhave Rural Hospital (AVBRH), Sawangi (Meghe), Wardha after obtaining permission from Institutional ethical committee. A total of 800 prescriptions were collected during April 2010 to July 2011 from nine various outpatient departments. The study sample comprised of new patients and follow-up cases of OPDs; while emergency ward and inpatients were excluded assuming a considerable change in their prescriptions.

The information regarding demographic, economic, diagnostic and treatment details were collected from the prescription and patient's interview and recorded on the Proforma. After completing the data collection, the prescriptions were analyzed for completeness, drug utilization (polypharmacy, FDCs, disease and treatment assessment) and socio-economic status of the patient. Finally the informations were compared between various outpatient departments.

RESULTS

The present study was carried out in the nine outpatient departments (OPDs) of a medical institute in Central India to assess the prescribing habits of the medical practitioners. The catchment area of the hospital includes some districts of eastern Maharashtra like Wardha, Yavatmal, Amravati, Nagpur, Chandrapur, Buldhana, Nanded and Gadchiroli and other states like Andhra Pradesh and Madhya Pradesh. Out of 800 cases under study, 619 were new cases and remaining were follow ups of the previously registered cases. (Figure 1)

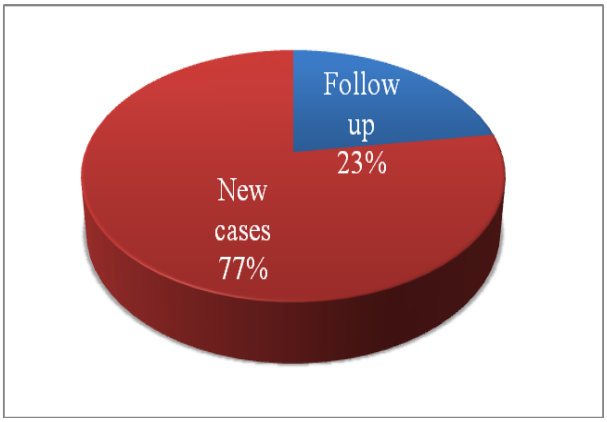

Figure1: distribution of new and follow up cases

The following parameters were analyzed and compared statistically between the nine outpatient departments. The mean number of drugs per prescription varied significantly ($p<0.05$, S) among various OPD as shown in Figure 2. It was least in psychiatry OPD (1.7) and maximum in dermatology OPD (2.86). The average number of drugs per prescription for the entire hospital was 2.39, ranging from 1 to 7 drugs.

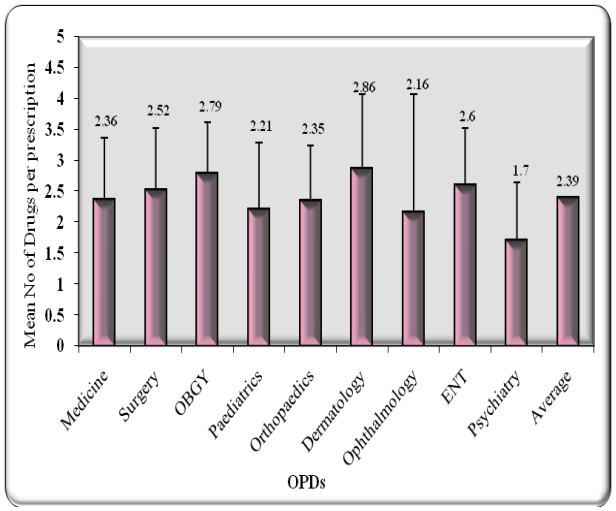

Figure 1: distribution of prescriptions in hospital according to no. of drugs per prescription

F-value: 7.07 p-value: ***p<0.05, S***

In this hospital, the prescriptions are written by either senior physicians or resident doctors. According to Diagram 3 and Table 1 the percentage of prescriptions written by them differed significantly among the OPDs (**p<0.0001, S**). The only department, where maximum prescriptions were written by residents, was OBGY.

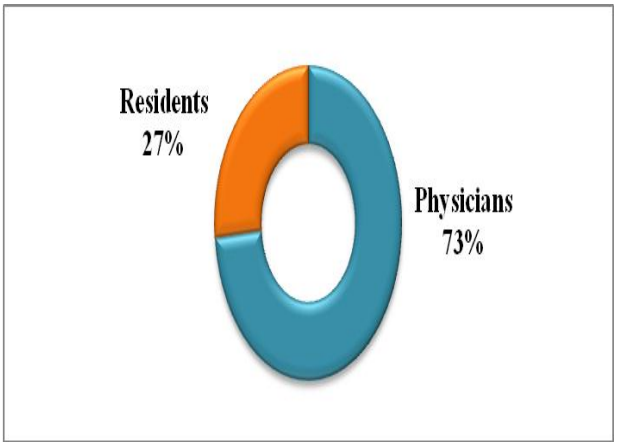

Figure 2: distribution according to the prescribers

Table 1: Distribution of prescription in the hospital according to prescribing doctor

OPD	Physicians	Residents	χ^2-value	p-value
Medicine	84	36	284.4	**p<0.0001 S**
Surgery	63	57		
OBGY	40	80		
Paediatrics	120	0		
Orthopaedics	90	30		
Dermatology	41	9		
Ophthalmology	50	0		
ENT	50	0		
Psychiatry	50	0		
Total	588	212		

Figure 4 shows the significant variation in the percent distribution of the generic drug prescribing among all the OPDs (**p<0.0003, S**). It is being least in OBGY OPD; while maximum generic prescriptions were seen in ENT OPD. Still the average generic prescribing was very low.

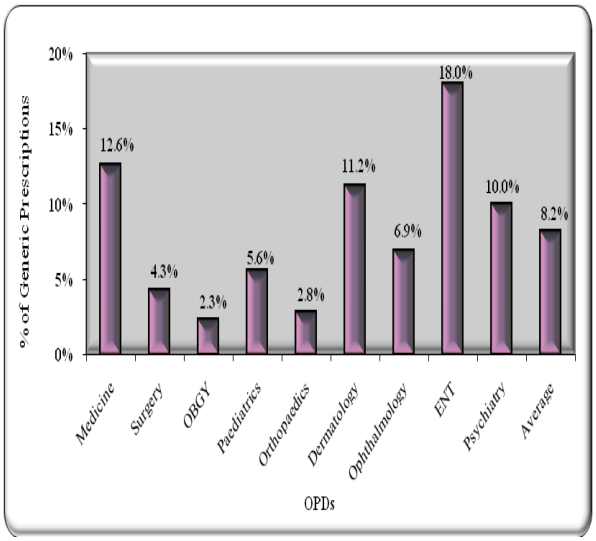

Figure 3: distribution of prescriptions in hospital according to generic prescribing
χ^2-value: 29.09 p-value: ***0.0003 S, p<0.05***

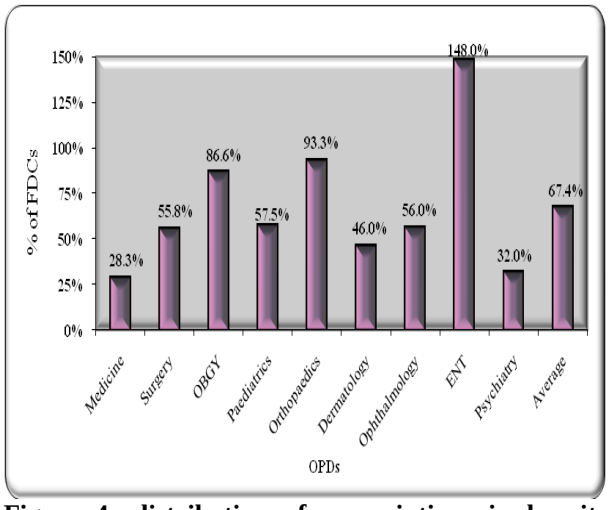

Figure 4: distribution of prescriptions in hospital according to presence of FDCs
χ^2-value: 181.3 p-value: ***p<0.0001, S***

The use of fixed dose combinations in the hospital was high; though there are significant variations in the use of FDCs among various OPDs as seen in Figure 5 (p<0.0001, S). The prescriptions containing FDCs were least in medicine OPD. In case of ENT OPD, more prescriptions contained two to four FDCs. Thus, the percent use of FDCs exceeded 100% in ENT prescriptions. Most FDCs were combinations of analgesics, antibiotics and nutritional supplements. The FDCs from essential medicine list were antacid, cotrimoxazole, iron + folic acid and combination of amoxicillin with clavulanic acid. The use of irrational FDCs like those containing topical steroids was also not uncommon.

The format adequacy data of all the OPDs as shown in Figure 6, indicates significant variations in the completeness of the prescriptions regarding presence of symptoms, diagnosis, dose, frequency and duration of drug administration in all the OPDs (**p<0.0001, S**).

On an average 54% prescriptions contained symptoms of the patients in the hospital; the least being in dermatology and maximum in the OBGY OPD. In case of diagnosis, the variations in the presentation are highly significant. 100% dermatology prescriptions contained diagnosis while in OBGY OPD it was mentioned in only 2.5% prescriptions.

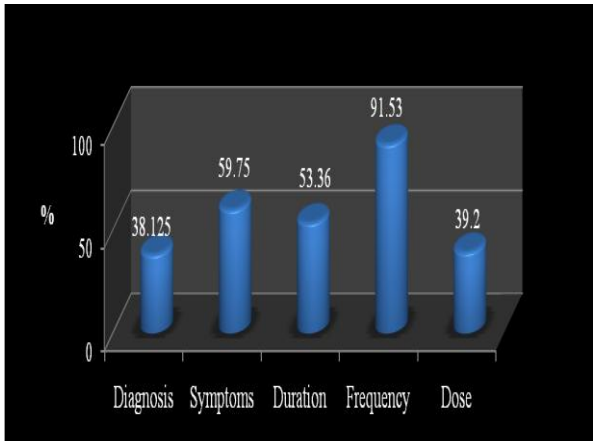

Figure 5: completeness of format of prescriptions

Table 2: Distribution of prescription in the hospital according to mention of symptoms

OPD	Present	Absent	χ^2-value	p-value
Medicine	62	58	235.5	**p<0.0001 S**
Surgery	67	53		
OBGY	113	7		
Paediatrics	98	22		
Orthopaedics	61	59		
Dermatology	10	40		
Ophthalmology	44	6		
ENT	11	39		
Psychiatry	12	38		
Total	478	322		

There was vast variation in the prescriptions in terms of providing drug administration details. Around 40% of the prescriptions contained dose, 53% mentioned duration and 91.5% had duration of treatment. The paediatric department was most consistent in prescribing the above details (around 75%) while department of orthopaedics was least consistent.

Table 3: Distribution of prescription in the hospital according to presence of diagnosis

OPD	Present	Absent	χ^2-value	p-value
Medicine	63	57	388.8	**p<0.0001 S**
Surgery	66	54		
OBGY	3	117		
Paediatrics	18	102		
Orthopaedics	12	108		
Dermatology	50	0		
Ophthalmology	14	36		
ENT	41	9		
Psychiatry	38	12		
Total	305	495		

The use of injectable preparations was around 5% in the hospital; with maximum prescriptions from surgery and no injections prescribed in the ENT and ophthalmology OPD.

There was significant variation in the use of analgesics and antibiotics among the OPDs (**p<0.0001, S)**. Around 50% drugs prescribed in the orthopaedics OPD contained analgesics, while no analgesic was prescribed in the dermatology OPD. Non-steroidal anti-inflammatory drugs (NSAIDs) like diclofenac, aceclofenac, ibuprofen, paracetamol and aspirin dominate the use of analgesics and the choice of analgesic varies considerably within OPDs. Most of the analgesics were used as fixed dose combinations containing 2-3 NSAIDs together.

The use of antibiotics shows different trends. ENT and ophthalmology OPDs show maximum use while psychiatry and OBGY showing least use of antibiotics. Oral and / or injectable penicillins and cephalosporins are the consistently used antibiotics across all the OPDs; second common group being fluoroquinolones.

The other commonly prescribed drugs were antacids, H1 antihistaminic drugs or proton pump inhibitors to supplement analgesic or antibiotic therapy. The nutritional supplements prescribed were iron supplements, vitamin B complex and calcium supplements in medicine, OBGY, paediatrics and orthopaedic OPDs.

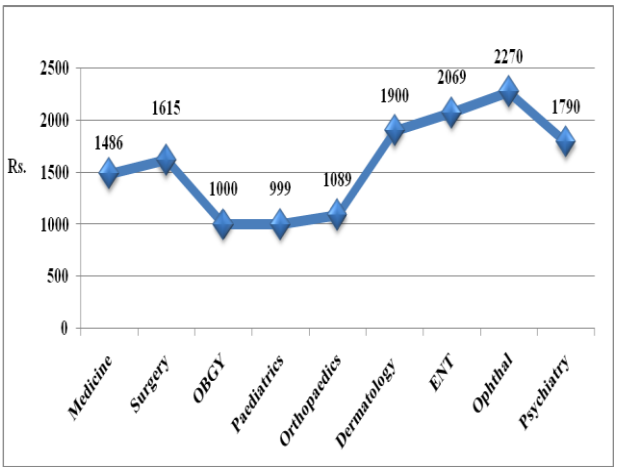

Figure 6: average monthly per capita income of patients (INR)

Most of the patients were farmers or workers with very low income. From Figure 7 it is evident that the average monthly per capita income of the patients visiting the hospital was Rs. 1579 only. According to Prasad's Classification of socio-economic status, they belong to social classes of II and III.

DISCUSSION

The study was an attempt to find the existing pattern of prescription writing in a public health facility which caters to the health care needs of a rural poorly educated population.

The computerized registration system in this hospital allows keeping an appropriate record of the patient's personal details. The relative lack of patient's information in the prescription is otherwise a common error found in many other studies done by Kumari R et al[4], Mallet HP et al[5] and Sharma P et al.[6]

In this study the mention of symptoms and diagnosis was absent in nearly 50% of prescriptions; a trend similar to those found by Kumari R et al[4], Dineshkumar B et al[7], Lamichhane et al[1] and Ravishankar et al.[8]

In the study by Kumari R et al[4], it was mentioned that the prescriptions were written by expert prescribers and large number of resident doctors. Similarly, in our study 73.5% prescriptions were prescribed by senior physicians and rests by resident doctors.

In this study, there were gross inadequacies in the important parameters related to the disease and the drug administration. The incompleteness of prescriptions is a universal error as suggested by other studies as well.[9],[4],[7]

The average (mean) number of drugs per prescription is an important parameter while doing a prescription audit. In this regard, the value found in this hospital was 2.39 ± 0.34, which is comparable with the results of Jordan (2.3)[10], Brazil (2.4)[11] and India (2.5)[12]. The variations found were enormous in similar studies conducted at different regions in India and in other countries. The highest values found were from Nigeria (3.99 ± 1.55)[3], Tamilnadu (3.75)[13], Luclnow (3.1 ± 1.6)[4]. Also, lowest values were observed by Lamichhane et al (1.99)[1] and Shankar PR et al (1.5)[14]. Since, WHO has recommends that average number of drugs per prescription should be 2.0[15], the results of our study reflects polypharmacy which may lead to adverse drug reactions, decrease adherence to drug regimens and unnecessary drug expenses.

In this study on an average 8.2% drugs were prescribed by generic names. In India high generic prescribing have been observed in Tamilnadu (96.5%)[13], Maharashtra (60%)[16], Nepal (59%)[17]. While many other studies carried out in India and the neighboring countries show generic prescribing pattern similar to our study. These include studies like Jordan where it was only 5.1%[10], Nigeria (41.9%)[3], Andhra Pradesh (27.3%)[9], Lucknow (27.1%)[4]. The most likely reason behind such inclination for the use of branded medicines instead of generics as seen in present as well as other studies might be either highly powered salesmanship of drug manufacturing companies to sell their products or the unawareness among prescribers for the advantages of generic prescribing including minimizing confusion, less cost of therapy, less dispensing errors, offering more rational therapy.

The analysis of prescriptions for the use of fixed dose combinations shows that 63.37% prescriptions contained FDCs ranging from 1 to 4 FDCs per prescription. The most widely prescribed FDCs which are not having any rational basis are the analgesics, multivitamin combinations and cold and cough mixtures. The advantage of combination of two or more analgesics over single analgesic preparation is questionable. Also, the combinations of ampicillin with cloxacillin and ofloxacin with ornidazole and many other similar combinations were most commonly and repeatedly used in almost all the OPDs. There is no proven additive or synergistic antibacterial effect of these combinations. Thus, use of such combinations raises questions about the rationality of drug prescribing.

When the incidence of use of fixed dose combinations in the entire hospital was compared with other studies it was observed that, our values were higher than those found by Akande et al (8%)[3], Vijayakumar TM et al (16.8%)[9], Lamichhane DC et al (15.8%)[1] and Kshirsagar et al (18%)[18] but, comparable to the findings of Rishi RK et al (59%)[19]. A sizable portion of drugs prescribed by brand names were fixed dose combination drug formulas. Thus, irrational use of FDCs adds to another error of use of brand names.

The incidence of use of injections in the hospital was found to be 5%. This is a far below and favorable figure in comparison to that set forth by WHO in this concern i.e. less than 10%. Studies conducted in other parts of India reported that the injection practices are comparatively lower i.e. 0.2% by Karande S et al[20], Rehan et al (0.9%),[21] Lamichhane et al (0.96%)[1], Kumari R et al (1.7%)[4] and Kumar J et al (2.36%).[22]

In congruence to many other studies, the common groups of drugs prescribed in our study were antibiotics and analgesics. Antibiotics contributed to around 19.4% of the total drugs prescribed in our hospital, which is comparable to the studies done in Nepal (23.96%)[23] and Lucknow (20.6%)[4]. Studies done in various regions of India show very high antibiotic usage in public health centres as seen by Kotwani A et al[24] in Delhi, De Costa A et al[25] in Bhopal, Kanakambal et al[13] in Madurai and Thomas M et al[26] in Vellore. Along with the rational FDCs like amoxicillin - clavulanic acid and cotrimoxazole, the use of irrational fixed dose combinations of ampicillin - cloxacillin, ciprofloxacin-tinidazole, ofloxacin - ornidazole was prevalent in this hospital. Irrationality of the use of antimicrobial FDCs could be due to trend of using more than one antimicrobial agent for common infections, non-use of first choice antimicrobials according to provisional diagnosis. It is the need of time prescribers should be

made aware of the demerits of irrational prescribing and they should detain from prescribing irrational FDCs.

The second common group of medicines prescribed in our study was analgesics, accounting for 13.6% of the total drugs prescribed. The analgesic prescribing in other studies varied greatly as seen from Vijayakumar TM et al in Andhra Pradesh (5.3%),[9] Shankar PR in Nepal (15.09%)[23], Kumari R et al in Lucknow (17.7%)[4], Akande TM et al in Nigeria (19.7%)[3] and Kanakambal S et al in Madurai (21%)[13], though the choice of analgesics among various OPDs was similar to this study.

CONCLUSIONS

The socio-economic status of the patients attending this institute is very low; the prescribing errors done on behalf of doctors are translated in the form of high cost of health expenses paid by such poor patients. This study concludes that there is deviation of the prescriptions from the ideal format of prescription writing as is evident from the missing information about the diseases and drugs, polypharmacy, non-generic prescribing and use of large number of rational as well as irrational FDCs.

This study illustrates the usefulness of conducting prescription monitoring studies in hospital settings and also serves as a framework upon which institutional drug policy can be formulated for educational intervention and improvement in prescribing patterns.

REFERENCES

1. Lamichhane DC, Giri BR, Pathak OK, Panta OB, Shankar PR. Morbidity profile and prescribing patterns among outpatients in a teaching hospital in Western Nepal; MJM, 2006; 9(2): 126-133
2. Sawalha AF, et al. Analysis of prescriptions dispensed at community pharmacies in Nablus, Palestine. EMHJ, 2010; 16(7): 788-792.
3. Akande TM, Ologe MO. Prescription pattern at a secondary health care facility in Ilorin, Nigeria. Annals of African Medicine, 2007; 6(4): 186-189.
4. Kumari R, Idris MZ, Bhushan V. Assessment of prescription pattern at the public health facilities of Lucknow district. IJP, 2008; 40(6): 243-247
5. Mallet HP, Njikam A, Scouflair SM. Evaluation of prescription practices and of the rational use of medicines in Niger. Sante, 2001; 11: 185-93.
6. Sharma P, Kapoor B. Study of prescribing pattern for rational drug therapy. JK Science, Jul-Sep, 2003; 5(3): 107-9.
7. Dineshkumar B, Raghuram T, Radhaiah G, Krishnaswamy K. Profile of drug use in urban and rural India. Pharmacoeconomics, Apr, 1995; 7(4): 332-46.
8. Ravishankar P, Pranab KS, Upadhyay DK, Dubey AK, Subish P. Drug utilization among surgical outpatients. TMJ, 2006; 56(2-3): 230-234.
9. Vijayakumar TM, Sathyavati D, Subhashini T, Grandhi S, Dhanaraju MD. Assessment of prescribing trends and rationality of drug prescribing. Int J of Pharma, 2011; 7: 140-143.
10. Otoom S et al. Evaluation of drug use in Jordan using WHO prescribing indicators. Eastern Mediterranean Health Journal, 2002; 8(4-5): 537-43.
11. Acurcio FA, Perini E, Magalhaes SM, Terceiro LG, Vieira Filho JM, Coutinho KE, et al. Analysis of medical prescriptions dispensed at health centers in Belo Horizonte, Minas Gerais, Brazil. Cad Saude Publica, 2004; 20: 72-9.
12. Ghimire S, Nepal S, Bhandari S, Nepal P, Palaian S. A prospective surveillance of drug prescribing and dispensing in a teaching hospital in Western Nepal. JPMA, Oct, 2009; 59(10): 736-731.
13. Kanakambal S, Murugesh N, Shanthi M. Drug prescribing pattern in a tertiary care teaching hospital in Madurai (Tamilnadu). IJP, 2001; 33: 223.
14. Shankar PR, Dubey AK, Rana MS, et al. Drug utilization with special reference to antimicrobials in a Subhealth post in Western Nepal. J Nep Health Research Council, Oct, 2005; 3(2): 65-9.
15. Sharif SI, Al-Shaqra M, Hajjar H, Shamout A, Wess L. Patterns of drug prescribing in a hospital in Dubai, United Arab Emirates. Libyan J Med., 2007; 3(1): 10-12.
16. Potharaju HR, Kabra SG. Prescription audit of outpatient attendees of secondary level government hospital in Maharashtra. IJP, Apr; 2011; 4 3(2): 150-156.
17. Kafle KK, Shrestha N. Drug use indicators study in Surkhet district in Nepal. Health Development Project (HDP), May. 1992.
18. Kshirsagar MJ, Langade D, Patil S, Patki PS. Prescribing patterns among medical practitioners in Pune, India. Bulletin of the World Health Organization, 1998; 76(3): 271-275.
19. Rishi RK, Sangeeta A, Surendra K, Tailang M. Prescription audit: experiences in Garhwal (Uttaranchal), India. Trop Doct, 2003; 33: 76-79.
20. Karande S, Sankhe P, Kulkarni M. Patterns of prescription and drug dispensing. Indian J Pediatr, 2005; 72(2): 117-121.
21. Rehan HS, Lal P. Drug prescribing pattern of interns at a government healthcare centre in northern India. Trop Doct, 2002; 32: 4-7.
22. Kumar J, Shaik MM, Kathi MC, Deka A, Gambhir SS. Prescribing indicators and pattern of use of antibiotics among medical outpatients in a teaching hospital of central Nepal. Journal of college of Medical Sciences-Nepal, 2010; 6(2): 7-13.
23. Shankar PR, Partha P, Nagesh S. Prescribing patterns in medical outpatients. Int J Clin Pract, Sep, 2002; 56(7):549-51.
24. Kotwani A, Holloway K. Trends in antibiotic use among outpatients in New Delhi, India. BMC Infectious Diseases, 2011; 11: 99-107.
25. De Costa A, Bhartiya S, Eltayb A, Nandeswar S, Diwan VK. Patterns of drug use in the public sector primary health centers of Bhopal district. Pharm World Sci., Oct, 2008; 30(5): 584-9.

26. Thomas M, Govil S, Moses BV, Joseph A. Monitoring of antibiotic use in a primary and tertiary care hospital. J Clin Epidemiol, Feb, 1996; 49(2):251-4.