



ISSN: 2278-2648

# International Journal of Research in Pharmacology & Pharmacotherapeutics (IJRPP)

IJRPP | Vol.14 | Issue 3 | Jul - Sep -2025

www.ijrpp.com

DOI : <https://doi.org/10.61096/ijrpp.v14.iss3.2025.261-268>



## Research

### Drug utilization study in the ophthalmology out-patient department Of a tertiary care teaching hospital

Sapna patil<sup>\*1</sup>, L. Padma<sup>2</sup>, Varsha C<sup>3</sup><sup>1,2</sup>Department of Pharmacology, Sapthagiri Institute of Medical Sciences & Research Centre, Bangalore, India<sup>3</sup>Department of Ophthalmology, Sapthagiri Institute of Medical Sciences & Research Centre, Bangalore, India

\*Author for Correspondence: Dr. Sapna Patil

Email: sapnapatil75@gmail.com

	<b>Abstract</b>
Published on: 03 Jul 2025	<b>Background:</b> Drug utilization research focuses on how drugs are marketed, prescribed, and used, along with their medical, social, and economic impact. WHO-developed indicators help assess and improve prescribing practices.
Published by: DrSriram Publications	<b>Aims &amp; Objectives:</b> 1) To evaluate drug utilization patterns in the Ophthalmology OPD of a tertiary care hospital. 2) To assess the rationality of prescriptions based on the National Essential Drug List (NEDL).
2025  All rights reserved.	<b>Methods:</b> A prospective study was conducted in the Ophthalmology OPD of Sapthagiri Institute, Bangalore, from June to December 2022. A total of 1324 prescriptions were analyzed.
 <a href="#">Creative Commons Attribution 4.0 International License.</a>	<b>Results:</b> Monotherapy was used in 63.8% of cases. Generic prescribing was high (99%). Most drugs were eyedrops (94.7%), followed by ointments and oral forms. Dosage and treatment duration were noted in nearly all prescriptions. Moxifloxacin was the most common antibiotic (27%). Antiallergics (158), NSAIDs (64), steroids (20), and anti-glaucoma drugs (25) were also prescribed. Prescription errors were minimal.
	<b>Conclusion:</b> Prescribing was largely rational, aligned with NEDL, with low rates of polypharmacy and errors.
	<b>Keywords:</b> Drug Utilization, Rational prescription, Generic names

## INTRODUCTION

Medicines play an important role in the health care delivery. The use of medicines constitutes an important part of many medical treatments and disease prevention interventions.<sup>1</sup>WHO has defined drug utilization research as the marketing, distribution, prescription and use of drugs in society with special emphasis on the resulting medical, social and economic consequences. <sup>2</sup>To improve the overall drug use, especially in developing countries, international agencies like the WHO and INRUD have applied themselves to evolve *standard drug use indicators*. <sup>4</sup>These indicators and *periodic auditing* of drug utilization pattern provide feedback

on patient compliance (with respect to cost, size of the pill, side effects) due to the use of medicines<sup>5</sup>. These indicators help prescribers to know the *shortcomings in their prescription* writing and allow them to improve their performance from time to time. <sup>5</sup>It is an essential part of pharmacoepidemiology which describes the extent, nature, and determinants of drug exposure with the ultimate goal to facilitate rational use of drugs in the population. Drug therapy is a major component of patient care management in health care settings. Prescribers and consumers are flooded with a vast array of pharmaceutical products with innumerable brand names, available often at an unaffordable cost. Irrational and inappropriate use of drugs in health care system observed globally is a major concern. To address the rising microbial resistance, physicians readily accept and indiscriminately use newly developed expensive and broad spectrum antibiotics which further contribute to increase rates of antimicrobial resistance and health care costs.

Recently in the discipline of ophthalmology, there have been many drug developments and introduction of new ocular therapeutic agents. Antibiotics are widely prescribed for various ophthalmic diseases. Evidences have shown trends of resistance to different class of antibiotics often used in ocular therapeutics. Indiscriminate use of topical antibiotics and nonsteroidal anti-inflammatory drugs cause histological and structural changes in conjunctiva. In order to improve drugs therapeutic efficacy, minimize adverse effects, and delay development of resistance, drug utilization trends and patterns need to be evaluated periodically.

Drug utilization pattern needs to be evaluated from time to time so as to increase therapeutic efficacy and decrease adverse effects. Historically the pharmaceutical and medical profession have devoted considerable time and efforts to the development and rational utilization of safe and effective drugs for the treatment and prevention of illness.

There has been development of many new therapeutic agents which have made it possible to cure or provide the symptomatic control of many clinical disorders. However, in many circumstances drugs are not used rationally for optimal benefits and safety.

Realizing the enormous potential of drug utilization studies in the promotion of rational drug therapy, international agencies like WHO and International Network of Rational Utilization of Drugs (INRUD) have applied themselves to evolve standard drug use indicators and data collection methods. Auditing prescription also forms part of drug utilization studies, although rational use of drugs is quite a usual practice, monitoring of prescriptions and drug utilization studies can identify the associated problems and provide feedback to prescribers. Developing countries have limited resources for healthcare and drugs and it becomes very important to prescribe drug rationally so that the available resources can be utilized optimally.

Hence, the present study will give insight about the drug utilization pattern and the current prescribing practices of the ophthalmologists in a tertiary care centre located in Bangalore, that serves urban as well as rural population, which is referred from primary and secondary centres from nearby villages. Also, this monitoring and analysis of prescriptions and drug utilization study can identify the associated problems and provide feedback to the prescribers.

## METHODS

The present study is a prospective, Observational, descriptive study. A *pilot study* has been conducted at KLE Charitable Hospital, Yellur, Belagavi and the results have been obtained, but it was proposed that further research has to be done, with a larger sample size, hence the initiation of this study was decided. Before initiation of the study, approval was taken from the *Institutional Ethics Committee* of Sathagiri Institute of Medical Sciences & Research Center, Bangalore. The study was conducted at the Ophthalmology Out Patient Department.

**Study duration:** 07 months (June 2022 – December 2022).

**Study population:** all the patients visiting the ophthalmology OPD at this tertiary care teaching Hospital, according to the inclusion and exclusion criteria of the study.

**Sample size:** A total of 1324 prescriptions were analysed for the study in a duration of 07 months.

### Inclusion Criteria

Patients of any age group (above 18 years), Patients of either gender, Patients treated in Ophthalmology OPD for any disease condition.

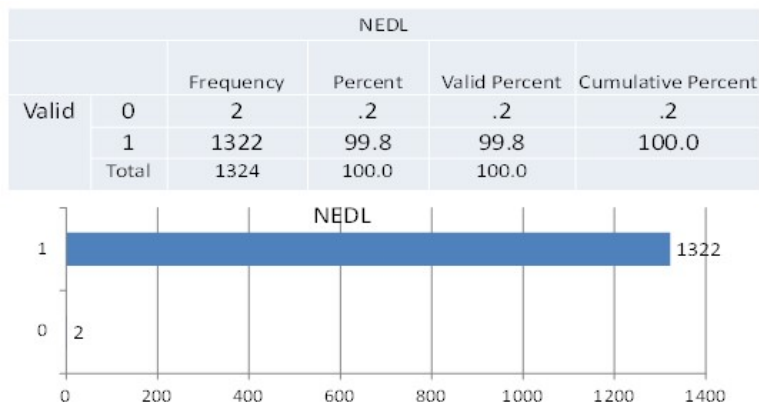
### Exclusion Criteria

Patients diagnosed with refractive errors and not prescribed any medications. All the prescriptions collected during the period of 07 months, were analysed for various parameters using a *pre-formed proforma*, which was prepared according to the WHO drug use indicators. The proforma consisted of the patient's details and details of the drugs prescribed, Names & classification of drugs, dosage forms, Route and frequency of administration, whether prescribed as generic/trade name, indications for which prescribed, duration of therapy and cost.

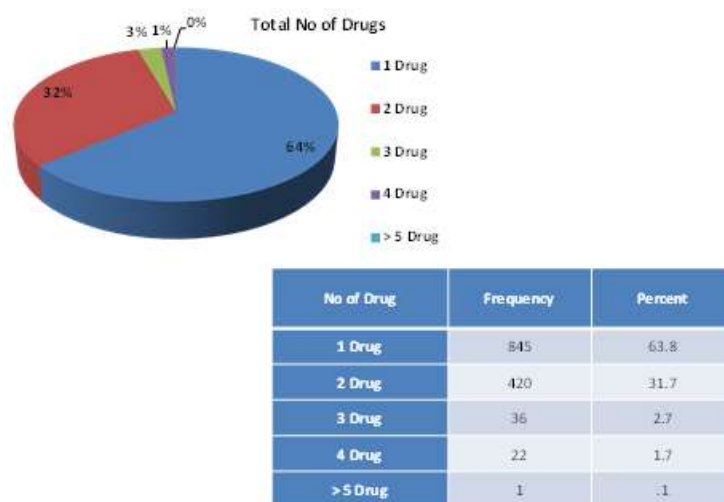
### Statistical analysis

The data collected was entered in MS Excel and analysis was carried out by using statistical software called SPSS version 20. The results were expressed in the form of descriptive statistics like mean, standard deviation, frequency, and graphs wherever required. The significance was set at 5% level ( $p < 0.05$ ).

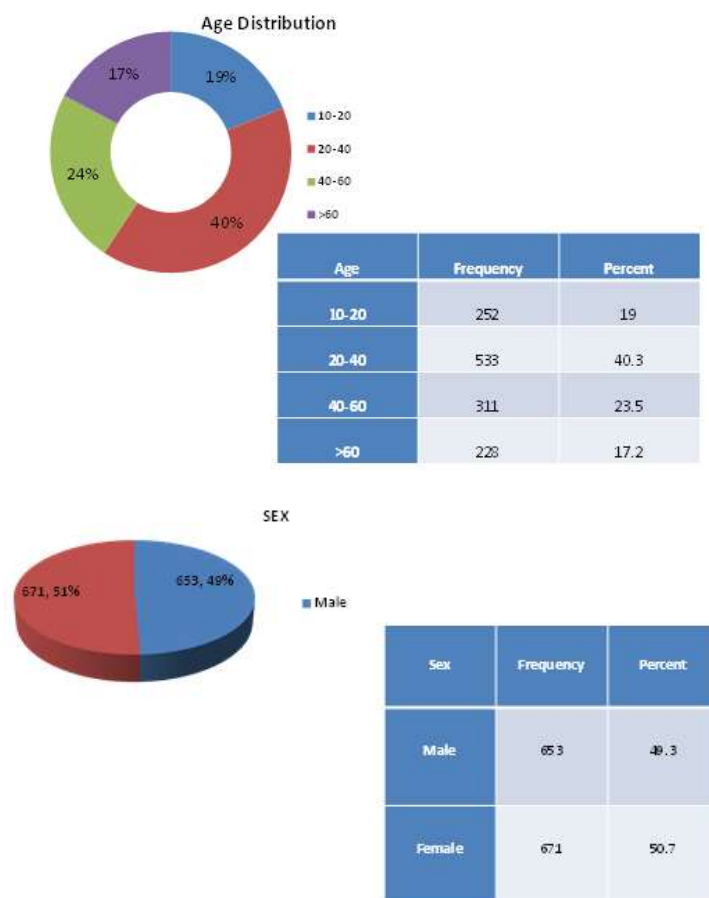
## RESULTS



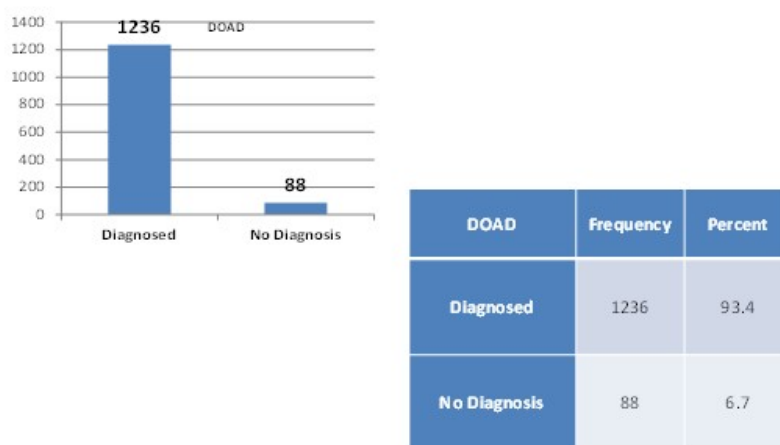
During the study period, a total of 1324 prescriptions were analysed. Most of the prescriptions were written and followed the NEDL.



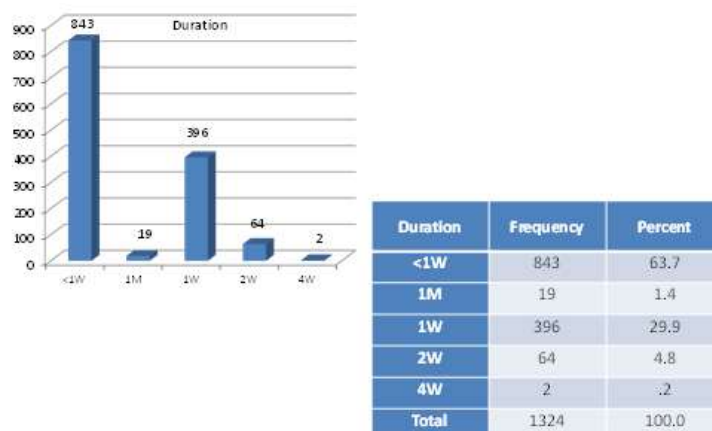
The number of drugs prescribed varied from one to five drugs. In most of the prescriptions (64%), monotherapy was being followed as compared to 2 drugs in 32%, 3 drugs in 3%, 4 drugs in 2% and more than 5 drugs in 1% of the prescriptions.



Out of the total number of patients, 653 were males and 671 were females. The age group varied from 10 to 60 years.

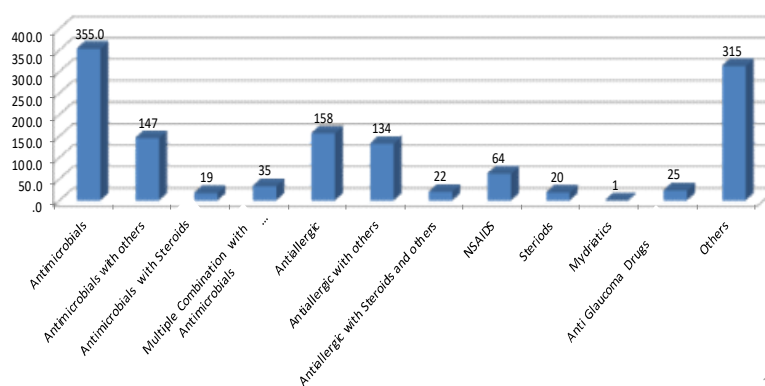


Patients with various ocular diseases visited the OPD during study period like conjunctivitis, blepharitis, episcleritis, scleritis, corneal foreign body, anterior uveitis, subconjunctival haemorrhage, diabetic macular oedema, hordeolum and blunt trauma. Diagnosis was mentioned in 93% of the total prescriptions.



The frequency of drug administration was less than 1 week in 64% of the patients and in 30% of patients, it was for 1 week.

Antimicrobials	355.0
Antimicrobials with others	147
Antimicrobials with Steroids	19
Multiple Combination with Antimicrobials	35
Antiallergic	158
Antiallergic with others	134
Antiallergic with Steroids and others	22
NSAIDS	64
Steroids	20
Mydriatics	1
Anti Glaucoma Drugs	25
Others	315

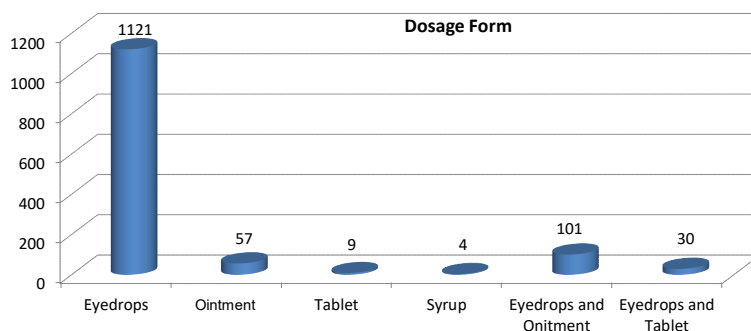


19

Antimicrobials were the most commonly prescribed drugs (in 355 prescriptions) while 315 prescriptions contained miscellaneous drugs like lubricants and vitamins.

The most commonly prescribed antimicrobial was moxifloxacin which is a broad spectrum drug and has good ocular penetration. Among the steroids, loteprednol, fluomethonolone, prednisolone and dexamethasone were prescribed. Olapatadine was the commonly prescribed anti-allergic drug.

Dosage Form	Frequency
Eyedrops	1121
Ointment	57
Tablet	9
Syrup	4
Eyedrops and Ointment	101
Eyedrops and Tablet	30



20

The dosage forms were mentioned in all the prescriptions. The most commonly prescribed dosage form was eyedrops (1121 patients) followed by eyedrops and ointment in 101 prescriptions. The other dosage forms prescribed were eyedrops, ointment, tablet and syrup.

## DISCUSSIONS

Drugs are prescribed rationally and in accordance with the NEDL. There were minimal prescribing errors, incidence of polypharmacy was low. Drugs play a key role in the health care system as they improve human health and promote well-being. However, to obtain a required effect drug must be used rationally and must be available, affordable, safe, and efficacious for users.<sup>1,2</sup>

To promote rational use of drugs in developing countries, INRUD have developed various indicators in collaboration with WHO. These indices help prescribers and health planners to provide a better quality of care to their patients. The average number of drugs per encounter is an important WHO prescribing indicator to measure the degree of polypharmacy. The drug utilization study in the ophthalmology outpatient department by Pradeep R Jadhav et al.<sup>19</sup> Priyanki et al.<sup>17</sup> and, Bhatt JH et al.<sup>26</sup> showed similar values as that of our study for the 'drugs count' per prescription while similar studies by Prajapati VI et al.<sup>21</sup> and, Vaniya HV et al.<sup>18</sup> showed higher values for a 'drugs count' per prescription compared to our study. In our study, 'Antimicrobials' is the most commonly prescribed category of drugs. In which 'fluoroquinolone' was the most prescribed class of drugs, which was similar to reports of most of the previous similar studies.<sup>17-18,20,22</sup> Single antibiotics and, antibiotics in combinations were prescribed frequently. Amongst fluoroquinolones, Moxifloxacin was most commonly prescribed. It has good ocular penetration and efficacy.

The drug utilization Polypharmacy is often associated with increased risk of drug interactions and adverse effects, higher cost and decreased compliance to patients. Hence, it is essential to keep the number of drugs per prescription as low as possible. In the present study, drugs are prescribed rationally and in accordance with the NEDL. There were not many prescribing errors, incidence of polypharmacy was low. It is important to prescribe drugs by generic names as chances of error in writing as well as the reading of the prescription are less with generic prescribing. Evaluation and monitoring of drug use pattern from time to time help in giving feedback to prescribers regarding. In this study there was minimal incidence of polypharmacy other hospital-based studies in ophthalmology have reported higher value.

Fluoroquinolones were the most common group of antibiotics prescribed which were similar to reports of previous studies done in ophthalmology.<sup>27,30</sup> Among the steroids, loteprednol and prednisolone were commonly prescribed. Among the anti-allergic drugs, Olapatadine is preferred as it is cost effective and patient compliance is good. Also eye drops are preferred to eye ointment as ointment is oil based causes blurring of vision and glare and if not washed properly after application, it can cause drug retention leading to toxicity.

Most of the prescriptions were written using brand name of the medication. Hence it is important to encourage the prescribers to write prescriptions using Generic names. However in our study, it was noticed that antimicrobials were prescribed with generic names and most of the lubricants with brand names.

This study was an attempt to describe the drug prescribing patterns in ophthalmology practice by WHO core drug use indicators. This kind of studies where prescriptions are audited at regular intervals, would help the prescribers in rational prescription and also minimise the prescription errors. In recent years, drug utilization studies has gained importance and evaluation of drug utilization pattern is to be considered a powerful means to find out the role of drugs in society, to increase the therapeutic efficacy and to increase the cost effectiveness of therapy in medical practices.

## CONCLUSION

There is a need to conduct similar studies in other departments as well and also to impart knowledge to the prescribers regarding the importance of rational drug prescription so that it benefits and is safe to the patients.

## ACKNOWLEDGEMENTS

The authors acknowledge and thank Dr Jayanthi V, Vice Chancellor, Dr Renuka, Principal and DR L Padma, HOD, Department of Pharmacology, of Saphthagiri Institute of Medical Sciences & Research Centre, Bangalore, for granting permission and support throughout the conduct of the study.

### Declarations

Funding: None

Conflict of interest: None

Ethical approval: obtained

## REFERENCES

1. Pooja prajwal, Mohandas Rai, Sharat kumar, Shrinivas Bhat U, Floyd Vernon D Souza, Drug utilisation pattern in ophthalmology Dept at a tertiary care hospital, Pooja Prajwal et al, Int J Pharm. 2013;4(8)
2. Hardik V Vaniya, Nishita H Darji, Vikas R Patel, Devdatta J Gohel, Drug Utilization Study in Ophthalmology Outpatients in a Tertiary Care Hospital Advances in Pharmacology and Pharmacy 4(2): 11-15, 2016
3. Bhavesh k. lalan, R. S. Hiray, B. B. Ghongane "Drug prescription pattern of outpatients in a tertiary care teaching hospital in maharashtra" Int J Pharm Bio Sci 2012 July; 3(3): P 225 - 229
4. Yasmeen Maniyar, Prabhu Bhixavatimath And Vidyashree Akkone. A Drug Utilization Study In The Ophthalmology Department Of a Medical College, Karnataka, India Journal of Clinical and Diagnostic Research. 2011 Feb, Vol-5(1):82-84
5. Amit kumar jain, seema jain, vikrant sharma, dadan ji pandey, anand Shukla, Drug utilization study in ophthalmology outpatient department in a tertiary care teaching hospital of western uttar pradesh, india" Asian J Pharm Clin Res, Vol 9, Issue 1, 2016, 354-356
6. Gangwar A, Singh R, Singh S, Sharma BD. Pharmacoepidemiology of drugs utilized in ophthalmic outpatient and inpatient department of a tertiary care hospital. J Appl Pharm Sci 2011;1:135-40
7. The Pursuit of Responsible use of Medicines: Sharing and Learning from Country Experiences. Available from: [http://www.apps.who.int/iris/bitstream/10665/75828/1/WHO\\_EMP\\_MAR\\_2012.3\\_eng.pdf](http://www.apps.who.int/iris/bitstream/10665/75828/1/WHO_EMP_MAR_2012.3_eng.pdf)
8. Nehru M, Kohli K, Kapoor B, Sadhotra P, Chopra V, Sharma R. Drug utilization study in out-patient ophthalmology department of Government Medical College Jammu. JK Sci 2005;7(3):149-51.
9. Jain VK, Shrivastava B, Agarwal M. Drug utilization pattern of drugs used along ophthalmic antiallergics formulations used in patients diagnosed with seasonal and perennial allergic conjunctivitis. Asian J Pharm Sci Res 2011;1:15-20.
10. Biswas NR, Jindal S, Siddiquei MM, Maini R. Patterns of prescription and drug use in ophthalmology in a tertiary hospital in Delhi. Br J Clin Pharmacol 2001;51(3):267-9.
11. Maniyar Y, Bhixavatimath P, Akkone V. A drug utilization study in the ophthalmology department of a Medical College, Karnataka, India. J Clin Diagn Res 2011;5:82-4.
12. Banjara SK, Mudavath K, Bhukya KD. Pattern of prescription and drug use in ophthalmology out-patient department in a teaching hospital. Glob J Res Anal 2014;3:92-3.
13. Hasmnis AA, Patil SS, Narayan KA, Rashid AK, Mohanty BK. Drug utilization study for acute illnesses in village Banggol, Malaysia; the findings of a household survey. Al Ameen J Med Sci 2010;3:165-8.

14. Lee D, Bergman U. Studies of drug utilization. In: Storm BL, editors. *Pharmacoepidemiology*. Chichester, UK: John Wiley & Sons; 2005. p. 401-17.
15. Jadhav PR, Moghe VV, Deshmukh YA. Drug utilization study in ophthalmology outpatients at a tertiary care teaching hospital. *ISRN Pharmacol* 2013;2013:768792.
16. Krishnaswamy K, Kumar BD, Radhaiah G. A drug survey – precepts and practices. *Eur J Clin Pharmacol* 1985;29(3):363-70. 20. Rambhade S, Chakarborty A, Shrivastava A, Patil UK, Rambhade A. A survey on polypharmacy and use of inappropriate medications. *Toxicol Int* 2012;19(1):68-73.
17. Nolan L, O'Malley K. Prescribing for the elderly. PartI: Sensitivity of the elderly to adverse drug reactions. *J Am Geriatr Soc* 1988;36(2):142-9.
18. Sharma D, Reeta K, Badyal DK, Garg SK, Bhargava VK. Antimicrobial prescribing pattern in an Indian tertiary hospital. *Indian J Physiol Pharmacol* 1998;42(4):533-7.
19. Gangwar A, Singh R, Singh S, Sharma BD. Pharmacoepidemiology of drugs utilized in ophthalmic outpatient and inpatient department of a tertiary care hospital. *J Appl Pharm Sci* 2011;1:135-40
20. World Health Organization (WHO) International Working Group for Drug Statistics Methodology, WHO Collaborating Centre for Drug Statistics Methodology, WHO Collaborating Centre for Drug Utilization Research and Clinical Pharmacological Services. *Introduction to Drug Utilization Research*. Oslo, Norway: WHO; 2003.
21. Lee D, Bergman U. Studies of drug utilization. In: Storm LB, editor. *Pharmacoepidemiology*. Chichester, UK: John Wiley & Sons; 2005. pp. 401–417.
22. Mirza NY, Desai S, Ganguly B. Prescribing pattern in a pediatric out-patient department in Gujarat. *Bangladesh Journal of Pharmacology*. 2009;4(1):39–42.
23. Duggirala A, Joseph J, Sharma S, Nutheti R, Garg P, Das T. Activity of newer fluoroquinolones against gram-positive and gram-negative bacteria isolated from ocular infections: an in vitro comparison. *Indian Journal of Ophthalmology*. 2007;55(1):15–19.
24. Afshari NA, Ma JJK, Duncan SM, et al. Trends in resistance to ciprofloxacin, cefazolin, and gentamicin in the treatment of bacterial keratitis. *Journal of Ocular Pharmacology and Therapeutics*. 2008;24(2):217–223
25. Biswas NR, Jindal S, MairajSiddiquei M, Maini R. Patterns of prescription and drug use in ophthalmology in a tertiary hospital in Delhi. *British Journal of Clinical Pharmacology*. 2001;51(3):267–269.
26. Maniyar Y, Bhixavatimath P, Akkone V. A drug utilization study in the ophthalmology department of a medical college, Karnataka, India. *Journal of Clinical and Diagnostic Research*. 2011;5(1):82–84.
27. Mohanty M, Mohapatra S. Drug utiliation pattern of topical ocular antimicrobials in a tertiary care hospital. *Indian Journal of Pharmacology*. 2003;35(6):p. 399.
28. Pradhan SC, Shewade DG, Tekur U, et al. Changing pattern of antimicrobial utilization in an Indian teaching hospital. *Int J ClinPharmacolTherToxicol*. 1990;28:339–343
29. Nehru M, Kohli K, Kapoor B, Sadhotra P, Chopra V, Sharma R. Drug utilization study in outpatient ophthalmology department of Government Medical College. *JK Science*.2005;7:149–51.
30. World Health Organization. How to investigate drug use in health facilities. Selected drug use indicators. WHO/DAP/93.1. WHO, Geneva, 1993