

**STUDY ON DRUG UTILIZATION PATTERN OF ANTIBIOTICS AMONG
DERMATOLOGY IN-PATIENTS OF A TERTIARY CARE TEACHING HOSPITAL,
MANDYA, KARNATAKA**Nashrah Basri¹, A. Vikneshwari² and Divyashree N.^{3*}¹IV Pharm. D, Bharathi College of Pharmacy, Bharathinagara, Mandya, Karnataka.²Professor, Department of Pharmacy Practice, Bharathi College of Pharmacy, Bharathinagara Mandya, Karnataka.³Assistant Professor, Department of Pharmacy Practice, Bharathi College of Pharmacy, Bharathinagara Mandya, Karnataka.

*Corresponding Author: Dr. Divyashree N.

Assistant Professor, Department of Pharmacy Practice, Bharathi College of Pharmacy, Bharathinagara Mandya, Karnataka.

Article Received on 08/01/2024

Article Revised on 28/01/2024

Article Accepted on 18/02/2024

ABSTRACT

Introduction: Skin conditions rank as the 18th leading cause of disease burden worldwide. The dermatological therapy strives to deliver safe & minimal doses of drugs. The purpose of this study is to validate prescription practices and encourage the rational use of antibiotics. This study may help doctors to prescribe antibiotics more wisely, potentially decreasing the financial strain on their patients. **Objectives:** Employing the World Health Organization's drug use indicators, this study aims to assess antibiotic prescriptions trends in dermatology, identify the prevalence of skin conditions, and outline current therapeutic approaches. **Materials & Methods:** This was a retrospective, record-based study conducted over a 3 month period. The patients were assessed based on their demographic details, diagnosis, and antibiotics prescribed. **Results:** Throughout 3months, the records of 250 patients were gathered, and the prescriptions were examined to assess the prescribing trend. The finding revealed a higher prevalence of female patients, constituting 58%, compared to 42% male patients. The predominant age group among the patients was 51-60 years. Pemphigus vulgaris was the most frequent skin disease, followed by chronic plaque psoriasis. Most often, Fusidic acid was prescribed in combination with corticosteroid. Additionally, the majority of the prescriptions were for topical drugs. **Conclusion:** The study noted a rational pattern of antibiotic prescribing, with most of the prescribed medications being listed on the WHO Essential Drug List for 2023, reflecting a commendable pattern of prescription.

KEYWORDS: Dermatology, Antibiotics prescribing pattern, WHO essential drug list 2023, In-patient dermatology department, WHO drug use indicators.

INTRODUCTION

The marketing, distribution, prescription, and use of medications in a community with a focus on the ensuing social and medical repercussions is known as drug utilization (WHO 2003).^[1] For pharmacoeconomic, clinical, and educational reasons, drug usage research is crucial. It highlights the issues that result from drug usage and explains the pattern of drug use. This report also emphasizes the methods being used now to assist people use drugs responsibly. For medication to be used rationally, a prescription must be written for a well-researched medication at the right dosage, with the right information, and at an economical rate (WHO 2003).^[1] The goal of evaluating drug use is to provide a quantitative and qualitative description of the population using a certain drug (or class of drugs) and the conditions under which it is used such as indications, dosage, span

of treatment, previous or relevant treatments, and compliance.^[1]

The goal of studying prescribing patterns is to keep an eye on, assess, and if required recommend changes to medical professionals prescribing practices to improve the economy and rationality of healthcare.^[5] International organizations such as the WHO (World Health Organisation) & the INRUD (International Network for Rational Use of Drugs) have worked to produce standard drug usage indicators, particularly in developing nations. The primary goal of the WHO's drug use indicators is to establish a small set of objective metrics that can characterize the drug use environment in a nation, regions, or specific medical facility. These metrics, also known as indicators, will enable health planners, managers, & researchers to perform fundamental cross-sectional comparisons between various contexts in

various locations at various periods. Moreover, the indicators can be used to assess the effectiveness of interventions designed to modify drug-related characteristics.^[2]

Skin disease refers to disorders exclusively of the superficial layers of the skin^[8] Being the largest organ in the human body, the skin is an element of the integumentary system and is therefore vulnerable to damage by a variety of external variables including the environment, chemicals, and infectious agents, as well as intrinsic factors like metabolism, genetics, and immunity. Furthermore, many systemic diseases can be distinguished by their dermatological symptoms, which is why dermatology is sometimes claimed metaphorically as a mirror to various underlying diseases.^[5]

Being the most delicate & outermost layer of the human body, skin comes into close contact with every trigger factor that can result in an infection or disease. Ignorance, Poor hygiene, improper sanitization, drastic climate change, and overcrowding are some of the factors that contribute to skin problems, particularly in developing nations like India.^[6] Common skin conditions contribute significantly to the global illness burden. When taken as a whole, skin disorders rank 18th in the world in terms of health burden, and in 2010, they were fourth in terms of nonfatal health burden.^[5]

Skin problems account for 2% of all Outpatient Department consultations globally. Yet, there isn't any such information from India. Skin conditions such as pyoderma, acne, urticaria, dermatitis, scabies, fungal skin infections, alopecia, etc. are prevalent in this nation. Medications that are frequently prescribed for the treatment of skin conditions include steroids, antibiotics, antifungals, benzoyl peroxide, salicylic acid, anti-histamines, vitamins, minerals, and analgesics, depending on the prescriber's preference.^[4]

This study seeks to assess the pattern of antibiotic prescriptions in dermatology and to understand the variety of skin diseases along with their current treatments, focusing on patients admitted to the dermatology department of Mandya Institute of Medical Sciences'. It considers the impact of skin disease prevalence, the consequences associated with antibiotic resistance, and the importance of prescribing medications rationally, and using WHO drug use indicators as a basis for evaluation.

MATERIALS AND METHODS

This study was carried out with a retrospective record-based approach at Mandya Institute of Medical Sciences, having received approval from the Institutional Ethics Committee- MIMS. It commenced on November 10 and spanned 3 months, focusing on the dermatology in-patient department of MIMS. Patient records from those admitted to the dermatological in-patient department at

MIMS were collected for analysis. The sample size for this study was calculated using the formula considering the following assumptions: 95% confidence interval with 5% precision & 12% margin error. These parameters were substituted in the following formula,

$$n = Z^2 p (1-p)/d^2$$

Where, n = sample size;

p = proportion of people;

d = margin error;

Z = confidence interval at 95% (i.e., 1.96);

The calculation yielded a sample size of 266; however, in just 3 months period, only 250 samples were obtained.

Data Collection & Analysis

Each patient's prescription was tracked down and the relevant information was input in to the created profile forms in order to measure the prescription patterns. Following data collection, Excel was used to enter & analyse the data.

METHODOLOGY

Ethical consideration

Upon receiving authorization from Institutional Ethics Committee, the study was carried out. The entire information gathered for the study was treated with the utmost confidentiality and was utilized exclusively for the study.

Study procedure

Based on secondary references which imply articles, the study was carried out. Following a comprehensive conversation with the guide, a suitable data collection form was created to incorporate the essential data from the patient's prescription. Over 3 months, the patient records were gathered. After gathering 250 prescription records, the information was entered into Excel. After that, the data was examined, and conclusions were drawn as a result.

RESULTS

The study was carried out at the Mandya Institute of Medical Sciences' department of dermatology. Based on the study's criteria, a total of 250 Patient records were collected. A patient profile form that was appropriately designed was filled out with the necessary information from the patient case sheet. In this study, 250 patients' prescription data were examined.

Patient distribution based on gender

For 3 months, random records of 250 patients at MIMS hospital was gathered. 105 males & 145 females made up the total. This study indicates that there were more females than males.

Table 1: Gender-wise distribution.

Sex	Frequency
Female	145
Male	105

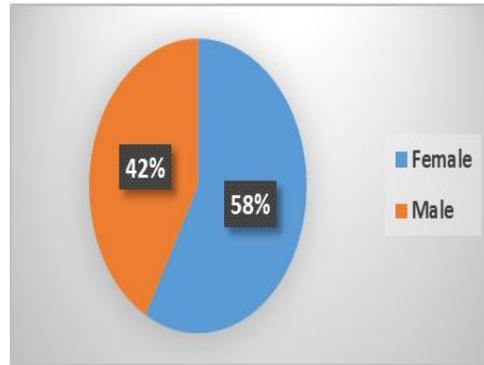


Fig. 1: Gender-wise distribution.

Patient distribution based on age

Using age as a basis, all of the patients were allocated in to 5 groups. The age group spanning from 51-60

contained the bulk of patients (42.4%), while the age group spanning from 21-30 contained the fewest patients (2%).

Table 2: Age-wise distribution.

Age	Female		Male	
	Number	Percentage	Number	Percentage
21-30	4	1.6%	1	04%
31-40	15	6%	9	3.6%
41-50	60	24%	36	14.4%
51-60	63	25.2%	43	17.2%
> 60	3	1.2%	16	6.4%

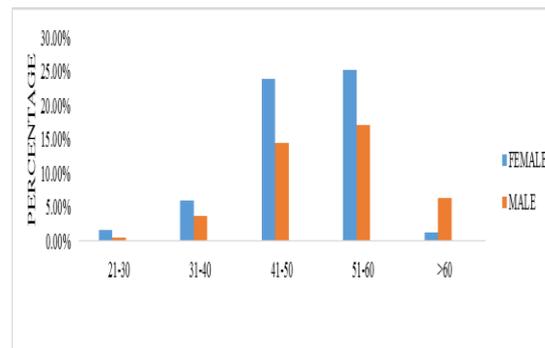


Fig. 2: Age-wise distribution.

Patient distribution based on disease condition

Throughout the evaluation of 250 prescriptions, numerous disease conditions were noted. This patient distribution by disease state illustrates the percentage of

the study population with a medical condition. Among the 250 individuals, with 24.8% of the 250 participants, pemphigus vulgaris was the most frequent disease, followed by chronic plaque psoriasis.

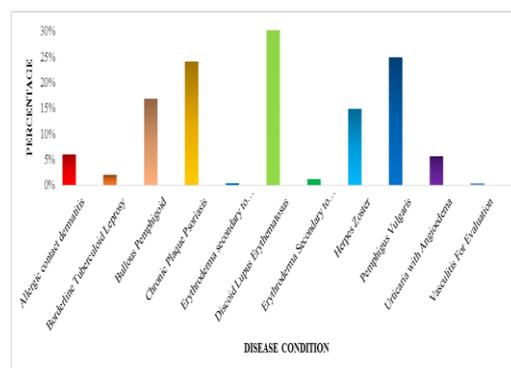


Fig 3: Patient distribution based on disease.

Table 3: Patient distribution based on disease.

Disease condition	NO. of patients	Percentage
Allergic Contact Dermatitis with secondary infection	15	6%
Borderline Tuberculoid Leprosy	5	2%
Bullous Pemphigoid	42	16.8%
Chronic Plaque Psoriasis	60	24%
Discoid Lupus Erythematosus	10	4%
Erythroderma Secondary to Phytophotodermatitis	1	0.4%
Erythroderma Secondary to Psoriasis	3	1.2%
Herpes Zoster	37	14.8%
Pemphigus Vulgaris	62	24.8%
Urticaria with Angiodema	14	5.6%
Vasculitis For Evaluation	1	0.4%

Distribution of drugs based on route of administration

Out of 250 prescriptions, 287 antibiotics were prescribed. The majority of prescription medications were

administered topically (155), followed by orally (87) and intravenously (45) in the least amount.

Table 4: Based on route of administration.

Route of administration	Total no of drugs	Percentage
Oral	87	30.3%
Iv	45	15.6%
Topical	155	54.0%

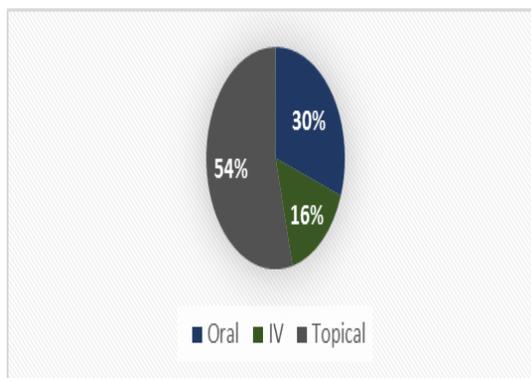


Fig. 4: Based on route of administration.

Drug categorization according to drug class

A total of 275 antibiotics were prescribed out of the 250 prescriptions. The most often prescribed drugs were

miscellaneous agents (28.8%), followed by azole antifungals (27.3%).

Table 5: Drug categorization according to class.

Class of drug	Name of drug	Number of prescriptions	Total number of prescriptions	Percentage
Penicillin	Amoxyclav	14	14	5.0%
Cephalosporins	Cefotaxim	42	45	16.3%
	Ceftriaxone	3		
Azole antifungals	Ketoconazole	65	75	27.2%
	Itraconazole	10		
Anti-leprotic	Dapsone + rifampicin + clofazimine	5	5	1.8%
Antimalarial	Hydroxy -chloroquine	10	10	3.6%
Imidazole antifungal	Clotrimazole	10	10	3.6%
Antiviral	Valacyclovir	37	37	13.4%
Miscellaneous	Mupirocin	79	79	28.7%
	Fusidic acid			

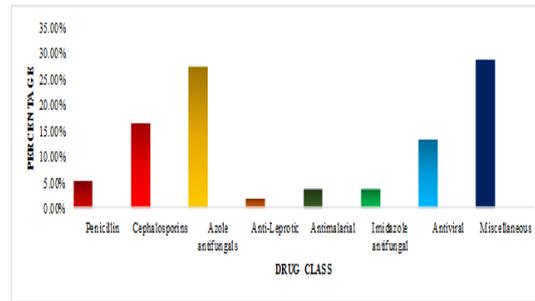


Fig. 5: Drug categorization according to class.

Patient distribution based on disease with gender

In the current study, prescription data from 250 patients was reviewed.

Table 6: Based on disease with gender.

Disease	Female	Male
Allergic Contact Dermatitis with secondary infection	7	8
Borderline Tuberculoid Leprosy	3	2
Bullous Pemphigoid	25	17
Chronic Plaque Psoriasis	40	20
Discoid Lupus Erythematosus	5	5
Erythroderma Secondary to Phytophotodermatitis	0	1
Erythroderma Secondary to Psoriasis	1	2
Herpes Zoster	21	16
Pemphigus Vulgaris	36	26
Urticaria with Angiodema	7	7
Vasculitis For Evaluation	0	1

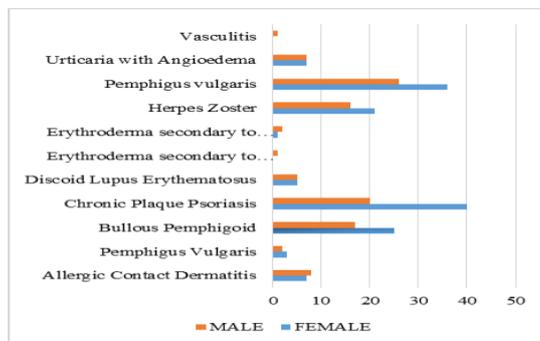


Fig. 6: Based on disease with gender.

Patient distribution based on drugs with route

Among the 250 prescriptions analysed, antibiotics were prescribed in 3 distinct forms: Topical, Oral, &

Parenteral. The majority of these prescriptions were for topical medications, indicating a preference for treating skin conditions with directly applied treatments.

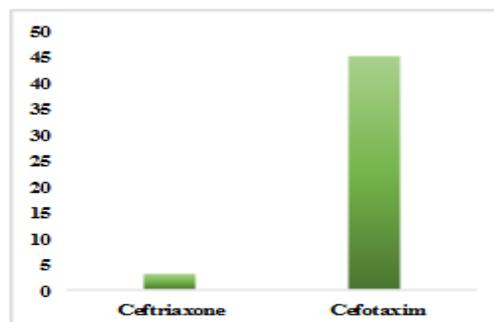


Fig. 7: Prescription use of IV antibiotics.

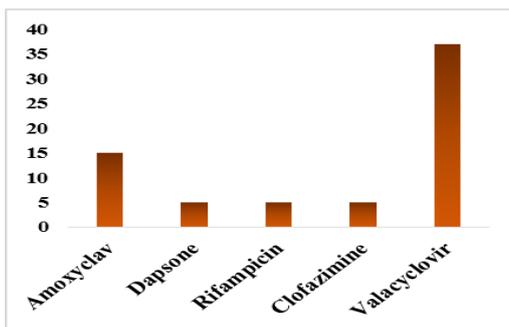


Fig. 8: Prescription use of oral antibiotics.

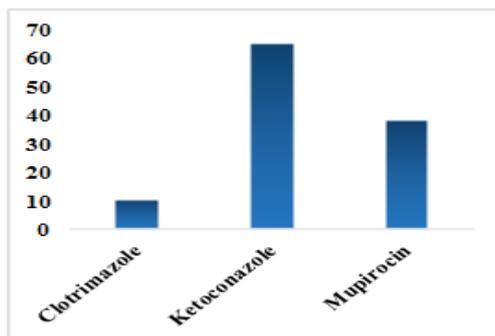


Fig. 9: Prescription use of topical antibiotics.

Analysis of number of drugs prescribed per prescriptions

A review of prescriptions revealed that a total of 287 antibiotics were prescribed. A polypharmacy analysis

revealed that 3 drugs at most and 0 at least were prescribed. The majority of the subjects were prescribed 2 medications (83%), with a significant portion receiving none or one medication (76%).

Table 7: Number of drugs per prescription.

Number of drugs per prescription	Number of prescriptions (%)
0	30.4%
1	30.4%
2	33.2%
3	6.0%

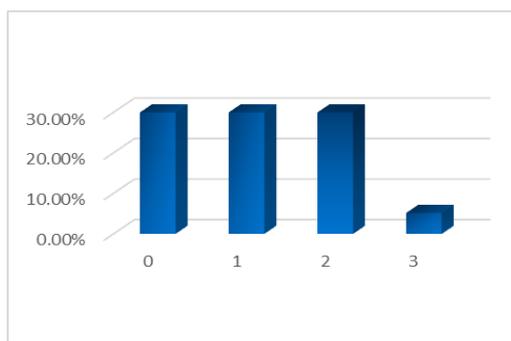


Fig. 10: Number of drugs per prescription.

Types of topical formulations

In the prescription study, a variety of topical formulations were utilized, such as lotions, creams,

shampoos. Among these, shampoos are typically used in majority, followed by creams then ointments.

Table 8: Types of topical formulation.

Type of formulation	Percentage
Ointment	24.5%
Cream	33.5%
Shampoo	41.9%

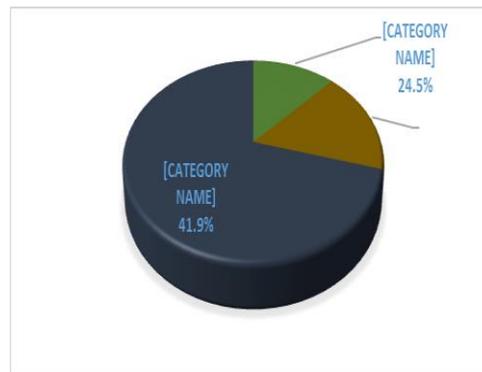


Fig. 11: Types of topical formulation.

Distribution of drugs prescribed by generic or brand names

Approximately 80% of the total 287 antibiotics prescribed to the research population were prescribed

using their generic names, while the remaining 20% prescribed under their brand names.

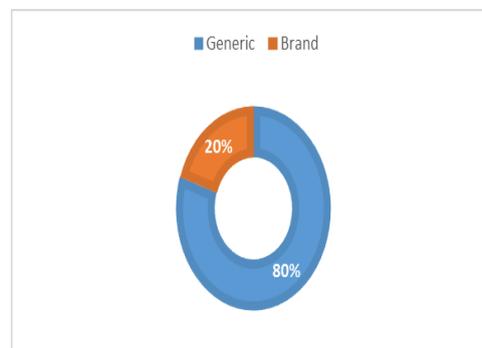


Fig. 12: Showing Brand & Generic names prescribed.

Who drug use indicators

As per who drug use indicators, 287 antibiotics in all were prescribed in 250 prescriptions. Other medications commonly prescribed alongside include vitamins, antihistamines, and topical steroids. On average, 4 drugs were prescribed per encounter, with an average of 3

antibiotics per encounter. About 80% of the drugs were prescribed by their generic names, 75% of the percentage were in accordance with the WHO EML, and 70% conformed to the NLEM (National List of Essential Medicines).

Table 9: Who drug use indicators.

Indicators	Frequency
Average number of drugs prescribed per encounter	4
Average number of antibiotics prescribed per encounter	3
Percentage of drugs prescribed by generic names	80%
Percentage of drugs prescribed from WHO	75%
Percentage of drugs prescribed from NLEM	70%

DISCUSSION

The current study examined the antibiotic prescription patterns of the in-patient dermatology department, MIMS. The study revealed that the majority of admissions for skin conditions were made by residents. Female patients constituted a higher percentage (58%) compared to male patients (42%). The bulk of the patients were in the age group spanning from 51-60 (42.4%), while the age group spanning from 21-30 contained the least patients. In terms of disease prevalence, pemphigus vulgaris topped the list at 24.8%, closely followed by Chronic Plaque Psoriasis at 24%, and then Bullous Pemphigoid at 16.8%. Other conditions

noted were Herpes zoster (14.8%), ACD with secondary infection (6%), Discoid lupus erythematosus (4%), Borderline Tuberculoid Leprosy (2%), Erythroderma secondary to Psoriasis (1.2%), Erythroderma secondary to phytophotodermatitis (0.4%) & Vasculitis (0.4%). The analysis of prescription patterns showed a preference for topical drug application, with oral administration coming next, and intravenous administration being least common. Among topical treatments, shampoos were the most frequently used, followed by creams and then ointments. The preference for topical over other administration routes, attributed to its reduced side effects, explains the high usage of topical medications in

dermatological treatments. Fusidic acid in combination with corticosteroid was commonly prescribed topical administration.

The majority of the prescriptions demonstrated a commendable level of caution in prescribing, with an emphasis on avoiding the use of multiple medications simultaneously, as most prescriptions comprised 2 or 3 drugs. A small number of these prescriptions included corticosteroids but refrained from incorporating antibiotics.

The analysis reveals that more medications were administered under their generic names. To reduce expenses and prevent confusion, medications must be prescribed under their generic names.

CONCLUSIONS

The primary goal of our study was to outline the prevailing methods of treatment by employing the World Health Organization's (WHO) drug use indicators and to analyse the distribution of skin diseases along with the patterns of antibiotic prescriptions. The findings revealed that the predominant form of medication administered was topical, with the vast majority of these medications being included in the WHO essential drug list for 2023, a practice that is promising & warrants support. Notably, prescriptions were mainly issued under generic names, with a significant portion of these generic drugs being distributed free of charge by the Hospital's pharmacy.

Studies on drug utilization serve as an important mechanism for promoting both rational & cost-effective prescribing practices. Our study found that physicians were prescribing antibiotics judiciously, playing a key role in mitigating the risk of antibiotic resistance among the populace.

The current trend towards more judicious antibiotic prescription practices is evident, promoting therapeutic benefits while simultaneously reducing the economic impact on patients due to medication expenses.

Our study's findings also highlighted that the leading factors contributing to skin diseases include poor personal hygiene, gender, and the standard of skin care, overcrowded living conditions, limited or inconsistent access to water, allergies, exposure to irritants, and the environmental milieu.

FUNDING

The funding for this research was provided by Rajiv Gandhi University of Health Sciences, Bengaluru, Karnataka.

REFERENCES

1. Uwase Ines Marie Aimee, S Ananthi, Mohanta GP and PK Kaviyaran. Study on drug utilization pattern in dermatology Department. *The Pharma Innovation Journal*, 2019; 8(9): 223-227. Available

from:

<https://www.thepharmajournal.com/archives/2019/vol8issue9/PartE/8-8-101-699.pdf>.

2. Rajiv Maini, Kaushal Kumar Verma, Nihal Ranjan Biswas, Shyam Sunder Agarwal. Drug utilization study in dermatology in a tertiary hospital in Delhi. *Indian J Physiol Pharmacol*, 2002; 46(1): 107-110.
3. Kalyani Deenadayalan, Pushpalatha Chinnam, Sam Pavan Kumar G. Prescription Pattern of Corticosteroids in Dermatology Cases in a Tertiary Care Teaching Hospital. *Journal of Contemporary Medicine and Dentistry* September-December, 2017; 5(3): 44-48.
4. Parvathy Gopimohan, Sudha M. J, Rathish T. Pillai², Ramani P. T. A study on the prescription pattern of antifungal drugs in the Dermatology Department of a tertiary care teaching hospital in Southern Kerala. *International Journal of Basic & Clinical Pharmacology* January, 2019; 8(1): 100-103. Available from: <https://www.researchgate.net/publication/329903915>.
5. Rohini Gambre, Akash Khobragade, Kamagonda Jalikar, Sadiq Patel¹ and Sanket Gaidhane. Analysis of prescribing pattern of drugs among patients attending dermatology output department of a tertiary care of hospital. *European Journal of Pharmaceutical & Medical Research*, 2018; 5(3): 259-273.
6. Rashmeen Naaz, Shricharith Shetty, Sharad Chand¹, Nandakumar UP, Vinay BC and Bharath Raj KC. Prospective Observational Study on Prescribing Pattern of Antifungal Drugs among the 400 Out-patients in Department of Dermatology in a Tertiary Care Hospital. *Biomedical & Pharmacology Journal*, 2021; 14(1): 311-316. Available from: <https://dx.doi.org/10.13005/bpj/2127>.
7. C. M. Divyashanthi, A. Nandhini, S. Adithiya Kumar. Study on drug utilization pattern of antibiotics among dermatology in-patients of a tertiary care teaching hospital, Karaikal, Puducherry. *International Journal of Basic & Clinical Pharmacology*, 3(6): 1072-1077. Available from: <https://www.ijbcp.com/index.php/ijbcp/article/view/1190/1065>.
8. Abebaw Tegegne, Fentaw Bialfew. Prescribing Pattern for Skin Diseases in Dermatology OPD at Borumeda Hospital, North East, Ethiopia. *Scientific Research Publishing*, 2018; 6: 1-8. Available from: <https://doi.org/10.4236/pst.2018.61001>.
9. Anuj kumar Pathak, Subodh Kumar, Manish Kumar, Lalit Mohan, Harihar Dikshit. Study of Drug Utilization Pattern for Skin Diseases in Dermatology OPD of an Indian Tertiary Care Hospital - A Prescription Survey. *Journal of Clinical and Diagnostic Research*, 10(2): 1-5. Available from: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4800544/>.