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Original Research Article

Drug Utilization Patterns and Prescribing Practices in Dermatology Outpatients at a Tertiary Care Teaching Hospital in South India: A Cross-Sectional Study Using WHO Indicators

Manjushree A.[1], Neelamma[2]

[1]Assistant Professor, Department of Pharmacology, M. S. Ramaiah Medical College, Bengaluru, Karnataka, India

[2]Assistant Professor, Department of Pharmacology, Karwar Institute of Medical Sciences, Karwar, Karnataka, India

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Corresponding author: Dr. Manjushree A.

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Abstract

Introduction: The skin, the largest organ of the human body, is frequently affected by a wide spectrum of disorders involving the superficial layers. Skin diseases contribute significantly to global morbidity and are among the leading causes of non-fatal disease burden. Drug utilization studies provide valuable insights into prescribing patterns and help assess the rational use of medicines. The present study was undertaken to evaluate drug utilization patterns in common skin diseases and to analyze prescribing practices using World Health Organization prescribing indicators.

Materials and Methods: A prospective, observational, cross-sectional descriptive study was conducted among outpatients attending the Department of Dermatology at Raichur Institute of Medical Sciences, a tertiary care hospital. A total of 688 prescriptions were analyzed over a one-year period. Data were collected using a structured proforma based on WHO guidelines, and parameters such as demographic characteristics, disease distribution, and prescribing indicators were evaluated using descriptive statistics.

Results: Tinea was the most common dermatological condition (33.2%). The majority of patients were males (65.7%), with the highest proportion in the 21–30 years age group (25.2%). A total of 1720 drugs were prescribed, with an average of 2.5 drugs per prescription. Generic prescribing was high (98.6%), and 70.5% of drugs were prescribed from the essential medicines list. Oral route was most commonly used (57.5%), followed by topical (41.8%). Antifungals (31.6%), antihistaminics (27.1%), and antibiotics (13.4%) were the most frequently prescribed drug classes.

Conclusion: The study demonstrates largely rational prescribing practices with low polypharmacy, high generic prescribing, and limited use of injections. However, there is scope for improving adherence to essential medicines lists. Regular prescription audits and drug utilization studies can enhance rational drug use, optimize therapeutic outcomes, and support policymakers in improving healthcare delivery.

Keywords: Drug Utilization, Dermatology Outpatients, Polypharmacy, WHO Prescribing Indicators.

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Introduction

The skin, a vital component of the integumentary system, is the largest organ of the human body and serves as the primary interface between the internal milieu and the external environment [1]. Owing to its extensive exposure, it is vulnerable to a wide array of extrinsic factors such as environmental pollutants, chemicals, and infectious agents, as well as intrinsic factors including metabolic, genetic, and immunological disturbances [2].

Additionally, many systemic diseases manifest through dermatological signs, making the skin a "mirror" reflecting underlying internal disorders [3]. Skin diseases are highly prevalent worldwide and contribute significantly to the global burden of disease [4]. It is estimated that 30–70% of individuals are affected by skin conditions at some point in their lives, with even higher prevalence in certain at-risk populations [5]. Although rarely fatal, dermatological disorders impose substantial physical discomfort, psychological distress, social stigma, and financial burden, particularly due to their chronic and recurrent nature [6].

Globally, skin diseases rank among the leading causes of nonfatal disease burden, emphasizing

their public health importance [7]. In India, dermatological conditions constitute a considerable proportion of outpatient consultations, with common disorders including dermatitis, acne, fungal infections, urticaria, and alopecia [8]. However, prescribing practices in dermatology often face challenges such as irrational drug combinations, overuse of antibiotics and multivitamins, and frequent prescription of drugs from the same class [9]. Several drug utilization studies conducted across the country have highlighted concerns such as polypharmacy, low rates of generic prescribing, and inadequate adherence to essential drug lists, raising serious issues regarding rational drug use [10].

Rational use of medicines, as defined by World Health Organization, implies that patients receive medications appropriate to their clinical needs, in doses tailored to individual requirements, for an adequate duration, and at the lowest possible cost [11]. Drug utilization research plays a crucial role in evaluating prescribing patterns, identifying inappropriate practices, and guiding interventions to promote safe, effective, and economical therapy [12]. Despite its importance, data on drug utilization patterns in dermatology, particularly in government tertiary care settings in India, remain limited. Therefore, the present study aimed to evaluate drug utilization patterns in common skin diseases, assess prescribing practices using WHO indicators, and promote rational drug use in the Dermatology Outpatient Department of a tertiary care hospital at Raichur, Karnataka.

Materials and Methods

A single-center, prospective, observational, cross-sectional descriptive study was conducted in the Outpatient Department (OPD) of Dermatology at Raichur Institute of Medical Sciences, a tertiary care teaching hospital, in collaboration with the Department of Pharmacology. The study was carried out over a period of one year, from January 2019 to December 2019. The study population included patients attending the dermatology OPD during the study period who fulfilled the eligibility criteria, with a total sample size of 688 patients.

Patients of all age groups and either gender who were prescribed at least one drug were included after obtaining written informed consent. Patients who were seriously ill, those with burns, leprosy or tuberculosis, pregnant or lactating women, patients already enrolled in other clinical trials, and those unwilling to participate were excluded. Additionally, revisit prescriptions and those containing only advised investigations were not considered. Prior approval was obtained from the Institutional Ethics Committee of RIMS, Raichur before initiation of the study.

Data collection was carried out after clinical evaluation by the dermatologist. Eligible patients were informed about the study, and upon obtaining consent, relevant details were recorded using a structured data collection form adapted from World Health Organization guidelines for drug utilization studies. The proforma included demographic details (age, gender), clinical diagnosis, and prescription-related information such as number of drugs, drug names (generic/brand), fixed-dose combinations (FDCs), dosage, route, and dosage forms. Information regarding inclusion of prescribed drugs in the National Essential Medicines List (NEML) was also documented, while maintaining patient confidentiality and anonymity.

Drug utilization patterns were assessed using WHO prescribing indicators, including average number of drugs per encounter, percentage of drugs prescribed by generic name, percentage of encounters with antibiotics and injections, and percentage of drugs prescribed from the essential medicines list.

Additional parameters such as demographic distribution, disease pattern, number and classes of drugs prescribed, routes and dosage forms, and proportion of fixed-dose combinations were also analyzed using standard WHO-recommended methods. The collected data were compiled and analyzed using SPSS v26, and descriptive statistics were applied. Results were expressed as frequencies and percentages.

Results

A total of 688 patients were included in the study. The majority of patients belonged to the 21–30 years age group (174, 25.2%), followed by ≤12 years (144, 20.9%) and 13–20 years (123, 17.8%). There was a gradual decline in patient frequency with increasing age beyond 40 years.

Males constituted a higher proportion of the study population (452, 65.7%) compared to females (236, 34.3%), indicating a male predominance in dermatology OPD attendance (Table 1).

Table 1: Demographic Characteristics of Study Population (N = 688)

Variable	Category	N (%)
Age Group (years)	≤12	144 (20.9%)
	13–20	123 (17.8%)
	21–30	174 (25.2%)
	31–40	113 (16.4%)
	41–50	62 (9.0%)
	51–60	48 (6.9%)
	>61	24 (3.4%)
Gender	Male	452 (65.7%)
	Female	236 (34.3%)

A total of 1720 drugs were prescribed across 688 prescriptions, with an average of 2.5 drugs per prescription. The majority of drugs were prescribed from the Essential Drug List (1183, 70.5%), and prescribing by generic name was notably high (1697, 98.6%), with minimal use of brand names (23, 1.3%). Antibiotics were prescribed in 226 (13.4%) encounters, while injections were used in only 9 (0.53%) cases. Fixed-dose combinations accounted for 43 (2.5%) prescriptions, and polypharmacy (>5 drugs) was observed in only 4 (0.57%) prescriptions (Table 2).

Table 2: Prescription Characteristics and WHO Prescribing Indicators (N = 688 prescriptions; 1720 drugs)

Parameter	Value
Total number of prescriptions	688
Total number of drugs prescribed	1720
Average drugs per prescription	2.5
Drugs from Essential Drug List	1183 (70.5%)
Drugs prescribed by generic name	1697 (98.6%)
Drugs prescribed by brand name	23 (1.3%)
Encounters with antibiotics	226 (13.4%)
Encounters with injections	9 (0.53%)
Fixed-dose combinations (FDCs)	43 (2.5%)
Polypharmacy (>5 drugs)	4 (0.57%)

Analysis of the number of drugs per prescription revealed that most prescriptions contained three drugs (328, 47.7%), followed by two drugs (223, 32.4%) and single-drug prescriptions (102, 14.8%). Prescriptions with four drugs were relatively few (31, 4.5%), while those with five or more drugs were rare (4, 0.6%), indicating a generally rational prescribing pattern with limited polypharmacy (Table 3).

Table 3: Number of Drugs per Prescription

Drugs per Prescription	Prescriptions N (%)
1	102 (14.8%)
2	223 (32.4%)
3	328 (47.7%)
4	31 (4.5%)
≥5	4 (0.6%)

With regard to the route and dosage form of drugs, oral medications were most commonly prescribed (965, 57.5%), followed by topical preparations (702, 41.8%). Parenteral administration was minimal (9, 0.5%), reflecting the predominantly outpatient-based management of dermatological conditions and preference for non-invasive routes (Table 4).

Table 4: Route and Dosage Form of Drugs (N = 1677) (Excluding decoded FDC duplication)

Route	N (%)
Oral	965 (57.5%)
Topical	702 (41.8%)
Parenteral	9 (0.5%)

Among the various drug classes, antifungals were the most frequently prescribed (531, 31.6%), followed by antihistaminics (456, 27.1%), antibiotics (226, 13.4%), and steroids (194, 11.5%). Other classes such as NSAIDs (80, 4.7%), moisturisers (68, 4.0%), antiparasitics (54, 3.1%), and keratolytics (43, 2.5%) were used less frequently, while antivirals (10, 0.6%) and miscellaneous drugs (58, 3.4%) constituted a minor proportion (Table 5).

Table 5: Major Drug Classes Prescribed (N = 1720)

Drug Class	N (%)
Antifungals	531 (31.6%)
Antihistaminics	456 (27.1%)
Antibiotics	226 (13.4%)
Steroids	194 (11.5%)
NSAIDs	80 (4.7%)
Moisturisers	68 (4.0%)
Antiparasitics	54 (3.1%)
Keratolytics	43 (2.5%)
Antivirals	10 (0.6%)
Others	58 (3.4%)

Route-wise distribution of major drug classes showed that antibiotics were prescribed both orally (134) and topically (91), with minimal injectable use (1).

Antifungals were predominantly prescribed via the topical route (276), followed by oral administration (225). Antihistaminics were exclusively prescribed orally (456), while steroids were mainly used topically (181), with limited oral (6) and injectable (7) use.

Antiparasitic drugs were largely prescribed topically (42) compared to oral use (12) (Table 6).

Table 6: Route-wise Distribution of Major Drug Classes

Drug Class	Oral N (%)	Topical N (%)	Injectable N (%)	Total
Antibiotics	134	91	1	226
Antifungals	225	276	0	531
Antihistaminics	456	0	0	456
Steroids	6	181	7	194
Antiparasitics	12	42	0	54

Analysis of commonly prescribed individual drugs revealed that levocetirizine was the most frequently prescribed drug (351, 20.4%), followed by clotrimazole (274, 15.9%) and fluconazole (255, 14.8%). Other commonly prescribed drugs included mometasone (179, 10.4%), amoxicillin (92, 5.3%), fusidic acid (89, 5.2%), chlorpheniramine (59, 3.4%), and diclofenac (53, 3.0%) (Table 7).

Table 7: Commonly Prescribed Individual Drugs (Top Drugs)

Drug	N (%)
Levocetirizine	351 (20.4%)
Clotrimazole	274 (15.9%)
Fluconazole	255 (14.8%)
Mometasone	179 (10.4%)
Amoxicillin	92 (5.3%)
Fusidic acid	89 (5.2%)
Chlorpheniramine	59 (3.4%)
Diclofenac	53 (3.0%)

Regarding disease distribution, tinea was the most common dermatological condition (229, 33.2%), followed by pyoderma (82, 11.9%) and dermatitis (48, 6.9%). Other frequently observed conditions included scabies (41, 5.9%), eczema (31, 4.5%), urticaria (28, 4.0%), psoriasis (27, 3.9%), acne (25, 3.6%), and pityriasis versicolor (23, 3.3%). A variety of less common conditions collectively accounted for 154 (22.4%) cases (Table 8).

Table 8: Distribution of Common Dermatological Conditions (N = 688)

Disease	N (%)
Tinea	229 (33.2%)
Pyoderma	82 (11.9%)
Dermatitis	48 (6.9%)
Scabies	41 (5.9%)
Eczema	31 (4.5%)
Urticaria	28 (4.0%)
Psoriasis	27 (3.9%)
Acne	25 (3.6%)
Pityriasis versicolor	23 (3.3%)
Others	154 (22.4%)

Discussion

Drug utilization studies are essential tools for evaluating prescribing practices and promoting rational use of medicines, particularly in resource-limited settings. Irrational drug use not only increases the risk of adverse drug reactions and drug interactions but also contributes to unnecessary healthcare expenditure.

Standardized indicators developed by the World Health Organization and the International Network for Rational Use of Drugs enable objective assessment and comparison of prescribing patterns across different healthcare settings. Periodic evaluation of drug utilization is therefore necessary to ensure safe, effective, and economical therapy. In the present study, male predominance (65.7%) was observed, which is consistent with studies by Vineeta D and Vijay Haribhau Mate, whereas some studies such as those by Manjusha Sajith reported female predominance [13-15]. The most affected age group in this study was 21–30 years (25.2%), which is comparable to findings by Manjusha Sajith et al. suggesting higher exposure to environmental and occupational risk factors in this age group [15].

The average number of drugs per prescription in the present study was 2.5, which is close to the WHO recommended value of 2 and comparable to studies by Yuwante (2.43), Maini R (2.6), and Mohamed Saleem TK (2.46) [17-19]. Polypharmacy was minimal (0.57%), indicating relatively rational prescribing practices. Fixed-dose combinations (2.5%) were used sparingly, which is desirable given their potential risks such as drug interactions and inappropriate dosing despite certain advantages like improved compliance. A high proportion of drugs were prescribed from the essential medicines list (70.5%), though lower than WHO recommendations, and comparable trends have been reported by Pugazhenthan T et al [20]. Notably, generic prescribing was very high (98.6%), aligning closely with WHO recommendations and reflecting cost-effective prescribing practices.

In terms of disease pattern, tinea was the most common dermatological condition (33.2%), consistent with findings by Gambre R et al., where dermatophytosis was also the leading condition [21]. This high prevalence may be attributed to hot and humid climatic conditions, poor hygiene, and overcrowding commonly seen in developing regions. Pyoderma (11.9%) was the second most common condition, similar to observations by S P Narwane, while dermatitis (6.9%) was less common compared to studies like Uwase Ines Marie Aimee, where it was predominant [22,23]. Variations in disease patterns across studies may be due to differences in geography, socioeconomic factors, and environmental exposure. Regarding prescribing patterns, antifungals (31.6%) were the most commonly prescribed drugs, followed by antihistaminics (27.1%), which is comparable to studies by Gambre R et al [21]. Topical antifungals, particularly clotrimazole, and oral fluconazole were frequently used, consistent with other Indian studies [15,21]. Antihistaminics such as levocetirizine were widely prescribed for symptomatic relief of pruritus. Antibiotic use (13.4%) was relatively lower compared to studies like Manjusha Sajith, indicating a more judicious approach [15]. Most drugs were prescribed via the oral route (57.5%), followed by topical route (41.8%), similar to findings by Chakrawarty R, although some studies have reported higher topical usage [16]. Injectable use was minimal (0.53%), well within WHO recommended limits, reflecting appropriate outpatient management.

Overall, the prescribing pattern in this study demonstrates a rational approach with scope for further improvement in adherence to essential drug lists and optimization of drug selection.

Conclusion

The present study highlights that dermatological prescribing practices in a tertiary care teaching hospital were largely rational, with an acceptable average number of drugs per prescription, minimal polypharmacy, high generic prescribing, and limited use of injections. Antifungals and antihistaminics constituted the majority of prescriptions, reflecting the predominance of infectious and pruritic skin conditions such as tinea.

Although a substantial proportion of drugs were prescribed from the essential medicines list, there remains scope for improvement to achieve optimal adherence to recommended guidelines. Overall, periodic drug utilization studies using standardized indicators of the World Health Organization are essential to monitor prescribing trends, promote rational drug use, and enhance the safety, efficacy, and cost-effectiveness of dermatological therapy.

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