



Original Researcher Article

A CROSS-SECTIONAL STUDY ON DRUG PRESCRIBING PATTERNS FOR DERMATOLOGICAL CONDITIONS IN GERIATRIC PATIENTS AT A TERTIARY CARE TEACHING HOSPITAL

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Abstracts: Background: Geriatric patients often present with chronic dermatological conditions requiring prolonged pharmacotherapy. Age-related changes and polypharmacy elevate the risk of inappropriate prescribing, contributing to adverse drug events. Evaluating prescribing patterns is crucial to ensure rational, safe, and cost-effective treatment. Prescription pattern analysis serves as a key tool to monitor therapeutic trends, assess prescriber behavior, and evaluate adherence to clinical guidelines, ultimately supporting improved pharmacological care in the growing elderly population. **Methodology:** A cross-sectional observational study was conducted over four months (July 2025–October 2025) in the Department of Dermatology, Venereology, and Leprosy at Sharda Hospital, Greater Noida, India. Geriatric patients aged 65 years and above with dermatological conditions were included using purposive sampling. Patients with non-dermatological diagnoses or significant comorbidities were excluded. A sample size of 196 was calculated using the Cochran formula. Data were analyzed using Microsoft Excel, with results presented as frequencies, percentages, and graphical illustrations. **Results:** A total of 196 geriatric patients were enrolled, with the majority belonging to the 65–70 years age group (32.7%) and a slight female predominance (51.5%). Papulosquamous disorders (31.6%) and cutaneous infections (22.8%) emerged as the most prevalent conditions. Antihistamines (34.9%) represented the most frequently prescribed drug class, followed by topical corticosteroids (23.5%). The mean number of drugs per prescription was 2.4 ± 0.5 , reflecting a moderate prescribing trend. Hypertension (58.7%) and diabetes mellitus (48.5%) were the leading comorbidities, while no adverse drug reactions were observed during the study period. **Conclusion:** The study highlights papulosquamous disorders as the leading dermatological condition in geriatrics, with antihistamines most prescribed. Findings underscore rational prescribing practices essential for optimizing safe, effective geriatric dermatological care.

Keywords: Dermatitis, Drug Prescriptions, Geriatrics, Polypharmacy, Pruritus, Skin Diseases

INTRODUCTION

Dermatological diseases constitute a major global health concern, accounting for nearly one-third of all non-fatal disease burden [1-2]. Despite their high prevalence, these conditions remain significantly underrecognized, often overshadowed by more visibly acute illnesses [2-3]. India is undergoing a demographic transition from a population with high fertility, high birth rates, and higher death rates to a population with low fertility, low birth, and death rates. As this happens, we see a steady increase in population of elderly in India with 8.6% of the population above age of 60 years as per 2011 census which is projected to go over 10% by 2020. The decadal growth rate of elderly population between 2001 and 2011 census has increased for the first time since independence. Also, the absolute number of elderly women has outnumbered elderly men in the last two decades.[4]

In India, skin disorders represent a substantial proportion of outpatient consultations, driven by complex interplays between climatic diversity, socio-cultural practices, environmental exposures, and healthcare access disparities. Among affected populations, the geriatric group presents unique diagnostic and therapeutic challenges, primarily due to physiological skin aging, immunosenescence, and the frequent coexistence of systemic comorbidities [4-7].

Aging skin undergoes both intrinsic and extrinsic changes. Intrinsic aging is mediated by mechanisms such as telomere shortening, oxidative DNA damage, microRNA dysregulation, and decreased collagen synthesis, while extrinsic aging is accelerated by cumulative ultraviolet (UV) radiation, environmental pollutants, smoking, and nutritional deficiencies [8]. These factors result in xerosis, barrier dysfunction, dyschromia, pruritus, atrophy, and increased vulnerability to infections and neoplasms. Geriatric patients frequently suffer from chronic dermatological conditions, many of which require prolonged pharmacological interventions [9-10].

The prescribing of dermatological medications in elderly individuals demands particular caution. Age-associated alterations in drug pharmacokinetics and pharmacodynamics, polypharmacy, and organ function decline

collectively heighten the risk of adverse drug reactions [11-13]. Inappropriate prescribing (IP)—including both potentially inappropriate medications (PIMs) and potential prescribing omissions (PPOs)—is prevalent and detrimental. The irrational use of fixed-dose corticosteroid combinations, empirical antibiotic use, and polypharmacy are especially concerning, contributing to increased morbidity, antimicrobial resistance, and avoidable healthcare costs [14-15]. Implementation of structured tools such as the Beers Criteria and STOPP/START guidelines can facilitate rational prescribing in geriatric dermatology. Recent regional studies from across India highlight varying dermatological morbidity patterns in older adults [3,16]. In Northern India, elderly patients (≥ 60 years) account for approximately 4.7% of dermatology OPD visits, with erythemato-squamous disorders (38.9%), infections (29.9%), and senile pruritus (9%) predominating. Southern India reports high rates of dermatitis (44.3%) and infections (40.6%) among rural elderly populations. Common age-related conditions include xerosis (61.6%) and seborrheic keratosis (76.6%). [17-18]

Despite these observations, there remains a paucity of region-specific, systematically collected data on geriatric dermatological prescribing. In light of India's rapidly expanding elderly population—projected to exceed 227 million by 2036—this study was conducted at a tertiary care teaching hospital in Greater Noida, Uttar Pradesh, to evaluate drug prescribing patterns in elderly dermatology patients.

Rationale of the Study

With the rising geriatric population in India, dermatological disorders in older adults are becoming increasingly common, yet remain underreported and understudied. Elderly patients often present with age-related skin changes compounded by chronic comorbidities, necessitating complex pharmacotherapy. This study aims to evaluate prescribing patterns for dermatological conditions in geriatric patients to promote safer, evidence-based treatment. By identifying prevalent skin conditions, commonly prescribed drugs, polypharmacy trends, and associated adverse drug reactions, the study seeks to improve clinical decision-making, minimize

inappropriate prescribing, and enhance therapeutic outcomes in this vulnerable population.

MATERIALS AND METHODS

Study Design

This was a hospital-based, cross-sectional observational study conducted to analyze prescribing patterns in geriatric patients with dermatological conditions. A purposive sampling method was adopted for patient selection.

Study Setting and Duration

The study was conducted in the Department of Dermatology, Venereology, and Leprosy at Sharda Hospital, Greater Noida. Data collection was carried out over a period of four months, from July 2025 to October 2025.

Study Population

Geriatric patients aged 65 years and above presenting with dermatological conditions during the study period were included.

Inclusion Criteria

- Patients aged ≥ 65 years.
- Patients presenting with dermatological complaints and seeking treatment in outpatient or inpatient settings.

Exclusion Criteria

- Patients presenting solely with non-dermatological or unrelated systemic conditions.
- Patients with significant comorbidities likely to alter dermatological management or interfere with drug prescribing patterns.

Sample Size Determination

The sample size was calculated using the standard formula:

$$N = z^2 \times P(100-P) / d^2$$

Where:

$$Z = 1.96 \text{ (Z-value for 95\% confidence)}$$

$$P = 85 \text{ (estimated prevalence)}$$

$$d = 5 \text{ (margin of error)}$$

$$N = (1.96)^2 \times 85 \times 15 / (5)^2$$

$$N = 3.8416 \times 1275 / 25$$

$$N = 196$$

Thus, the final sample size was 196 patients.

Ethical Considerations

The study received approval from the Institutional Ethics Committee of Sharda University (Ref. No.: **SU/SMS&R/76-A/2025/192**). Written informed consent was obtained from all participants prior to data collection. Patient confidentiality and data integrity were maintained throughout the study.

Data Collection Procedure

Data were collected prospectively from geriatric patients (aged 65 years and above) attending the Dermatology, Venereology, and Leprosy outpatient and inpatient. After obtaining written informed consent, patient demographics, clinical history, diagnosis, and details of all dermatological medications prescribed were recorded using a structured, prevalidated Case Record Form. Information on drug name (brand and generic), category, route, frequency, dosage, strength, and duration of therapy was documented. Additional data on comorbidities, past medications, and substance use were also captured. Only new patients diagnosed with dermatological conditions were included, while those with primary non-dermatological diagnoses or significant unrelated comorbidities were excluded.

Statistical Analysis

Data were entered and analyzed using **Microsoft Excel**. Descriptive statistics were used to summarize findings, including frequencies and percentages. Graphical representation (bar charts and pie diagrams) was used where appropriate. No specialized statistical software was employed.

RESULTS

Demographic Characteristics

A total of 196 geriatric patients were enrolled in the study. The majority belonged to the age group of 65–70 years (64, 32.7%), followed by 71–75 years (55, 28.1%), 76–80 years (53, 27.0%), and >80 years (24, 12.2%). Notably, almost 40% of patients were above 75 years, highlighting the predominance of advanced elderly in the cohort. These findings are detailed in Table 1, while Figure 1 visually depicts the progressive decline in patient numbers with increasing age. In terms of gender, female patients (101, 51.5%) slightly outnumbered males (95, 48.5%), suggesting a marginal female predominance. This distribution is summarized in Table 2 and illustrated in Figure 2, which demonstrates near-equal participation of both sexes. Regarding place of residence, 102 patients (52%) were from urban areas, while 94 (48%) belonged to rural backgrounds. Table 3 presents this distribution, and Figure 3 highlights the narrow

rural–urban difference, indicating a balanced representation of both populations.

Table1: Distribution of Patients According to Age Groups

Age group	Frequency	Percent
65-70	64	32.7
71-75	55	28.1
76-80	53	27.0
>80	24	12.2
Total	196	100.0

Table 2: Distribution of Patients According to Gender

GENDER	Frequency	Percent
Female	101	51.5
Male	95	48.5
Total	196	100.0

Table 3: Urban-Rural Distribution of Patients

URBAN/ RURAL	Frequency	Percent
Rural	94	48.0
Urban	102	52.0
Total	196	100.0

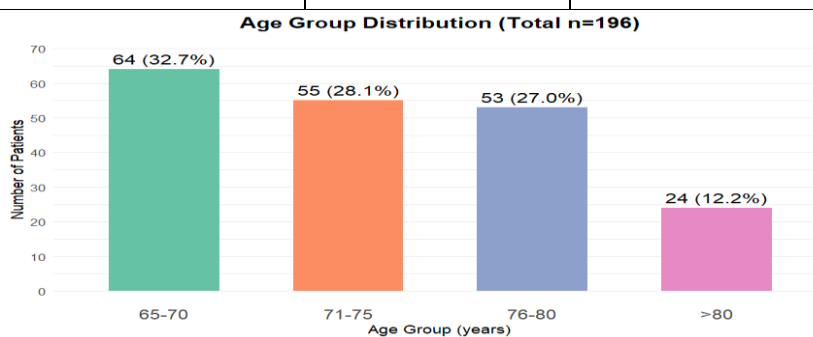


Figure 1: - Bar chart showing patient counts by age group

Gender Distribution

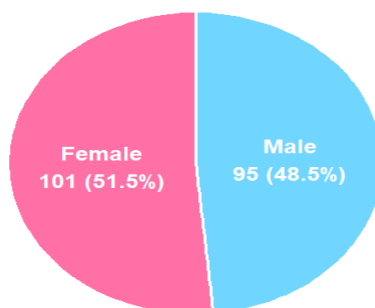


Figure 2:- Pie chart showing male and female proportions

Urban/Rural Distribution

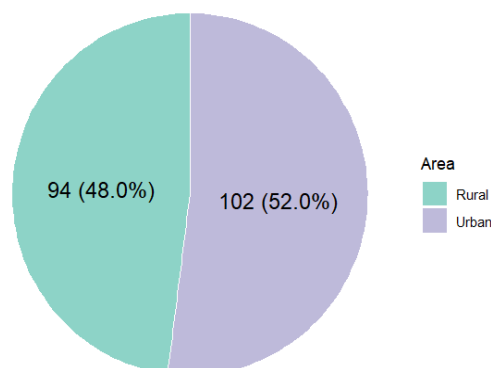


Figure 3:- Pie chart showing Urban/Rural distribution

Comorbidities

Among the 196 patients, only 9 individuals (4.6%) did not report any associated systemic illness, whereas the vast majority (187 patients, 95.4%) presented with at least one comorbidity (Table 4). Hypertension was the leading systemic comorbidity, observed in 115 patients (58.7%), followed closely by diabetes mellitus in 95 patients (48.5%). Hyperlipidemia was another frequent comorbidity, affecting 84 patients (42.9%). A diverse group of additional comorbidities,

categorized as “others,” was recorded in 63 patients (32.1%), highlighting the presence of multiple underlying health conditions beyond the commonly reported triad of hypertension, diabetes, and dyslipidemia (Figure 4). The high prevalence of systemic illnesses in this cohort underscores the complex interaction between dermatological conditions and general health, suggesting that dermatology patients often require holistic management beyond cutaneous therapy.

Table 4: Comprehensive Comorbidity Profile of Elderly Patients with Dermatological Conditions (n = 196)

Comorbidity Status	Specific Comorbidity	Frequency	Percentage
No comorbidities	-	9	4.6
At least 1 comorbidity	Hypertension	115	58.7
	Diabetes	95	48.5
	Hyperlipidemia	84	42.9
	Others	63	32.1
Total	-	196	100

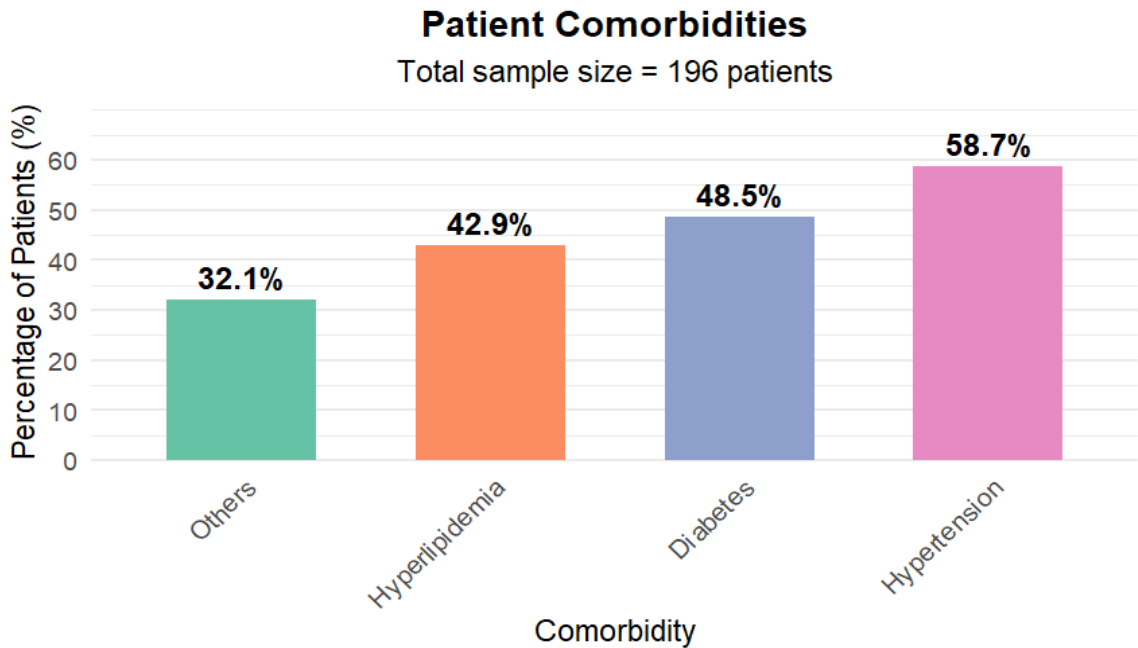


Figure 4: Bar chart showing comorbidities

Dermatological Disease Profile

A wide spectrum of dermatological conditions was observed in the study population (Table 5) and figure 5. Papulosquamous disorders were the most common, affecting 62 patients (31.5%). Within this group, eczema was the leading condition (9.1%), followed by seborrheic dermatitis (7.6%), chronic plaque psoriasis (5.6%), and lichen planus (5.1%). The predominance of papulosquamous dermatoses reflects their chronic and relapsing nature, which frequently prompts patients to seek medical consultation. Infective dermatoses constituted the second most frequent category (45 patients, 22.8%), with fungal infections being most common (7.1%), followed by viral (6.1%) and parasitic infestations

(5.6%). These findings indicate that infections continue to remain a major dermatological burden, particularly in areas with hot and humid climates where fungal and parasitic infections thrive. Pruritic conditions associated with systemic illness accounted for 42 cases (21.4%). These included lichen simplex chronicus (7.6%), prurigo simplex (6.1%), and prurigo nodularis (4.1%). Autoimmune and pigmentary disorders were also represented, with vitiligo (5.6%) and lichen sclerosus et atrophicus (3.1%) being the most prevalent. Vascular disorders were seen in 19 patients (9.7%), most frequently senile purpura (4.6%). Disorders of skin appendages were relatively less common, comprising 11 patients (5.6%), with senile

comedones (4.1%) and rosacea (1.5%) being the leading presentations. Overall, papulosquamous and infective disorders together represented more

than half of the dermatological diagnoses, demonstrating their predominance in clinical dermatology practice.

Table 5: Distribution of Patients According to Dermatological Diagnosis

Category	Disease	Frequency	Percentage
Papulosquamous Diseases	Eczema	18	9.14
	Seborrheic dermatitis	15	7.61
	Chronic Plaque Psoriasis	11	5.58
	Lichen Planus	10	5.08
	Pityriasis Rosea	8	4.06
Infections	Fungal Infections	14	7.11
	Viral Infections	12	6.09
	Parasitic	11	5.58
	Bacterial Infections	8	4.06
Itching due to Systemic Illness	Lichen Simplex chronicus	15	7.61
	Prurigo Simplex	12	6.09
	Prurigo Nodulosis	8	4.06
	Senile pruritis	7	3.55
Autoimmune Conditions	Vitiligo	11	5.58
	Lichen Sclerosus Atrophicus	6	3.05
Vascular Disorders	Senile Purpura	9	4.57
	Pigmented Purpuric Dermatoses	5	2.54
	Urticaria	5	2.54
Disorders of Appendages	Senile Comedones	8	4.06
	Rosacea	3	1.52
Total		196	100.00

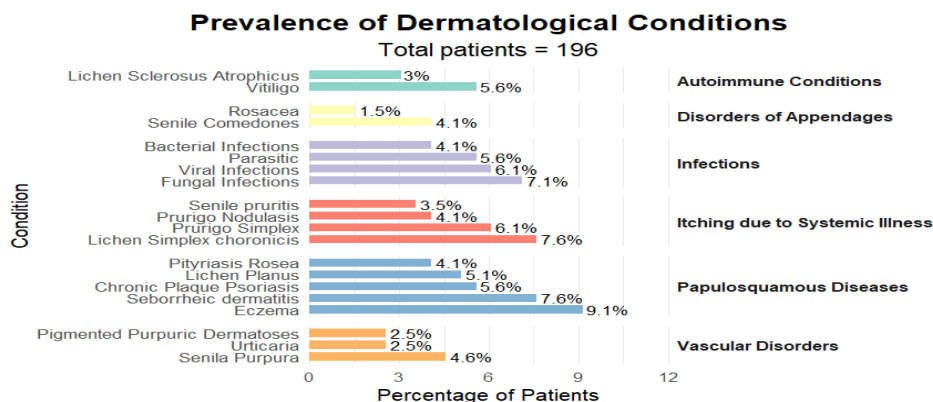


Figure 5: Diagnosis Distribution among patient

Prescribing Patterns

Drug utilization analysis revealed a preference for symptomatic relief and disease control using antihistamines and topical corticosteroids (Table 6 and figure 6). Among oral antihistamines, levocetirizine was the most commonly prescribed (34.9%), followed by fexofenadine (11.6%), desloratadine (5.8%), and hydroxyzine (5.8%). The frequent prescription of antihistamines indicates the predominance of pruritus across many dermatological conditions. Topical corticosteroids were another cornerstone of therapy, prescribed in a large proportion of cases. Mometasone (23.5%) and clobetasol (16.4%) were the most frequently used, whereas hydrocortisone (4.7%) and desonide (2.4%) were reserved for more sensitive sites or milder cases. Antifungal therapy was used both topically and systemically. Topical antifungals such

as luliconazole and amorolfine were prescribed in 5.9% of patients each, while oral itraconazole (8.9%) and terbinafine (5.9%) were preferred for extensive or recurrent infections. Supportive therapy included proton pump inhibitors, primarily pantoprazole (8.6%) and omeprazole (2.1%), to mitigate gastrointestinal side effects of systemic drugs. Systemic corticosteroids were used cautiously, with prednisolone (4.8%) and methylprednisolone (0.8%) prescribed in selected autoimmune conditions. Additional agents included NSAIDs (diclofenac 4.0%, aceclofenac 2.1%), antivirals (valacyclovir 3.4%, acyclovir 2.8%), topical calcineurin inhibitors (tacrolimus 8.7%), and antibiotics, which were least used (oral amoxicillin-clavulanic acid 1.3%, doxycycline 0.7%; topical mupirocin 1.5%, clindamycin 0.5%).

Table 6: Categories of Drugs Prescribed to Patients

Category	Drug Name	Frequency	Percentage
Topical Steroids	Mometasone	46	23.47
	Clobetasol	32	16.43
	Hydrocortisone	9	4.69
	Desonide	5	2.35
Oral Antihistamines	Levocetirizine	68	34.90
	Fexofenadine	23	11.63
	Desloratadine	11	5.82
	Hydroxyzine	11	5.82
Topical Antifungals	Luliconazole	12	5.92
	Amorolfine	12	5.92
	Ciclopirox Olamine	5	2.55
Oral Antifungals	Itraconazole	17	8.88
	Terbinafine	12	5.92
Oral Antibiotics	Amoxicillin Clavulanic acid	3	1.33
	Doxycycline	1	0.71
Oral Immunosuppressants	Prednisolone	9	4.77
	Methylprednisolone	2	0.84
Proton Pump Inhibitors	Pantoprazole	17	8.57
	Omeprazole	4	2.14
NSAIDs	Diclofenac	8	4.04
	Aceclofenac	4	2.08
Antivirals	Valacyclovir	7	3.37

	Acyclovir	5	2.76
Topical Calcineurin Inhibitor	Tacrolimus	17	8.67
Topical Antibiotics	Mupirocin	3	1.51
	Clindamycin	1	0.51

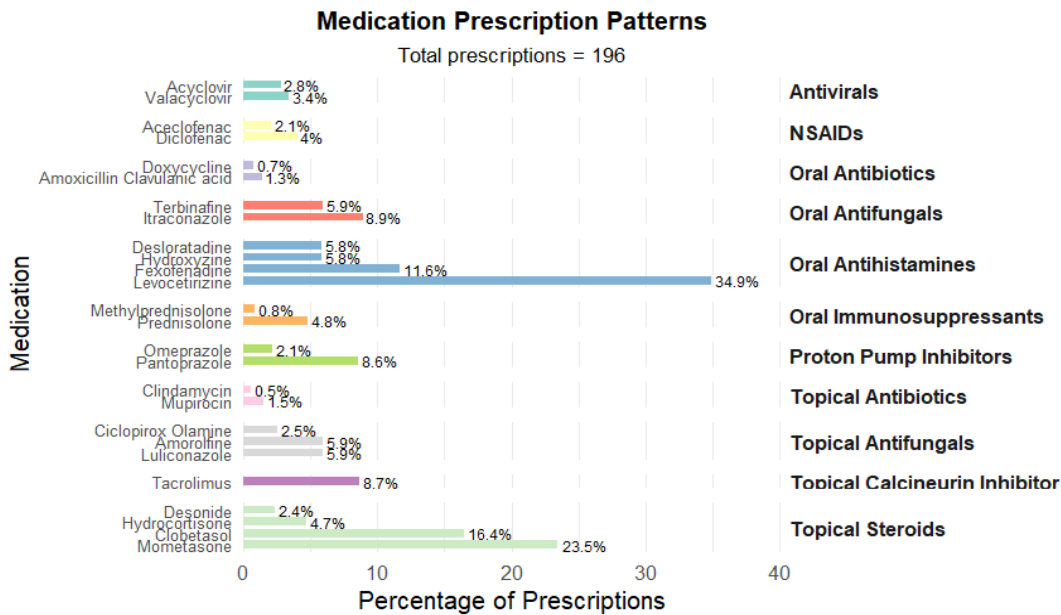


Figure 6: Bar chart showing most frequent combination

The average number of drugs per prescription was 2.4 ± 0.5 . Importantly, no adverse drug reactions were reported throughout the study, suggesting safe and rational prescribing practices.

Importantly, no adverse drug reactions (ADRs) were reported in the study population despite multiple drug therapies being common. This may reflect cautious prescribing practices, judicious drug selection, and possibly good tolerance among the geriatric cohort.

DISCUSSION

The present study evaluated dermatological and systemic health characteristics in 196 geriatric patients, emphasizing the relationship between cutaneous disorders, comorbidities, and therapeutic patterns. Papulosquamous disorders were the most common presentations (31.5%), with eczema (9.1%) and seborrheic dermatitis (7.6%) leading, followed by chronic plaque psoriasis and lichen planus. Infective dermatoses accounted for 22.8%, predominantly fungal infections, likely attributable to warm climatic conditions, reduced immunity, and comorbid diabetes. Pruritus was the most frequently reported symptom (56.4%), influenced by xerosis, systemic illnesses, and impaired skin

barrier with aging. Vesicobullous and autoimmune dermatoses were relatively less frequent but clinically relevant. Connective tissue diseases such as systemic lupus erythematosus, systemic sclerosis, discoid lupus erythematosus, and dermatomyositis were present in a minority of cases, consistent with previously documented low prevalence in geriatric cohorts [19,22]. The observed disease pattern indicates a transition from infectious to chronic inflammatory dermatoses with aging, a trend aligned with global dermatogeriatric observations. Comorbidities were nearly universal, present in 95.4% of patients [20–21]. Hypertension (58.7%), diabetes mellitus (48.5%), and hyperlipidemia (42.9%) predominated, highlighting the strong contribution of cardiovascular and metabolic disease to geriatric dermatology. Thyroid disorders, though less frequent, were associated with xerosis and occasional lichen planus, reflecting an autoimmune overlap. The high prevalence of systemic illness shaped both clinical expression and therapeutic decision-making, particularly in minimizing risks of adverse drug interactions. Prescription analysis reflected rational practices in accordance with WHO recommendations [23–25]. The mean drug count was 2.4 ± 0.5 per encounter,

notably lower than reports of six or more medications in comparable studies. Polypharmacy was uncommon, with very few prescriptions exceeding four drugs. Antibiotic prescribing was minimal (5.01%), and injectables were rarely used (0.97%). Topical therapy predominated, aligning with the safety considerations necessary in elderly skin, reducing systemic exposure and adverse drug reactions.

Oral antihistamines, mainly levocetirizine (34.9%), were the most frequently used systemic agents, reflecting the predominance of pruritic dermatoses. Topical corticosteroids, including mometasone (23.5%) and clobetasol (16.4%), were prescribed for inflammatory disorders with due regard to potency and safety in fragile elderly skin. Antifungal agents, both topical and systemic, were selectively used depending on disease severity. While prescribing was largely rational, only 0.3% of drugs were prescribed by generic name, and 32.2% were drawn from the essential drug list, reflecting limited integration of cost-effective prescribing practices. Dependence on branded formulations and prescriber familiarity likely account for this observation, consistent with reports from other developing regions. The findings demonstrate a high prevalence of chronic inflammatory dermatoses and pruritic conditions among elderly patients, closely linked to systemic comorbidities such as diabetes and hypertension. Rational prescribing patterns, minimal polypharmacy, and emphasis on topical agents highlight an age-appropriate therapeutic approach. However, the low rate of generic and essential drug prescribing underscores the need for policy and educational initiatives to optimize cost-effective dermatological care.

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ETHICAL DECLARATION

Written informed consent was obtained from all participants prior to data collection, ensuring a comprehensive understanding of the study's objectives and procedures. Participant confidentiality and privacy were strictly maintained throughout the study. The research protocol was reviewed and approved by the Institutional Ethics

Committee of Sharda University (Ref. No.: SU/SMS&R/76-A/2025/192).

CONFLICT OF INTEREST

The authors declare that they have no conflicts of interest in relation to this study.

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This study did not receive any external financial support. All research activities were conducted using the resources available to the authors.

AUTHOR CONTRIBUTIONS

SG and ANJ were responsible for conceptualization and study design. RA and SVG contributed to patient recruitment and data collection. RA and AFC performed data tabulation and preliminary analysis. ANJ and AKG drafted and critically revised the manuscript. All authors read and approved the final version of the manuscript for submission.

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