Original Article

Understanding the Patterns of Hospitalization in Dermatology: A retrospective record review from Pakistan

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Abstract

Background: Inpatient care in dermatology is often overlooked in low-resource settings despite the significant burden of severe skin diseases requiring hospitalization.
Objectives: This study aims to describe the patterns and demographic and length of stay associations in both years of dermatology admissions in a tertiary care hospital in Pakistan.
Materials and Methods: A retrospective record review was conducted at the Dermatology Department of Benazir Bhutto Hospital, affiliated with the Rawalpindi Medical University, reviewing all dermatology admissions from 1st January 2024 till 30th December 2024. Data was collected on demographic details, diagnoses, duration of hospital stay, and outcomes.
Results: Out of 371 patients, the most common causes of admission were autoimmune blistering diseases 15.9 %), extensive plaque psoriasis 15.36%, infections (14.2%), and erythroderma (10.5 %). The mean hospital stay was 7 days. Most patients were discharged successfully, while 4 patients required referral to other departments.
Conclusion: Autoimmune blistering dermatoses and extensive psoriasis were the leading causes of hospitalization in this setting. There were four patients requiring shifting to the medical ICU who later expired. Early recognition and prompt treatment are essential to reduce complications and hospital stay.
Keywords: Inpatients, Dermatology, Skin diseases, Cross-Sectional Study.

Introduction

Dermatology is an important outpatient specialty, with skin being the largest organ of the body.[1] Skin disorders have a variable spectrum of morbidity but relatively low mortality.[2,3] Nevertheless, certain dermatological conditions mandate admission in a hospital setting. Hospital admission may be required for regular clinical and laboratory monitoring, administration of parenteral therapy, advanced nursing care, and interdisciplinary consultations, or for academic purposes in teaching hospitals. Inpatient care is also an opportunity for patients with chronic skin illnesses to learn self-skin care, in other words, patient education. Studies have also proved that hospital admissions of patients with severe dermatological conditions are associated with improvements in quality of life.[1]

There are several common skin disorders known to cause some degree of psychosocial morbidity. Various Pakistani studies have shown that diseases such as cutaneous leishmaniasis, vitiligo, and acne reduce the Dermatology Life Quality Index (DLQI) scores. Many patients have reported an impairment in emotional well-being [4–7]. As many skin illnesses run a chronic course and lead to visible disfigurement, they cause psychological upsets as well. [7,8]

There is a geographical variation in patterns of skin dermatoses. In high-income countries, plaque psoriasis, autoimmune blistering disorders, chronic non-healing ulcers, and severe dermatitis account for the majority of admissions. [9-11]. Data from Pakistan suggests that immunobullous disorders, cutaneous infections, severe drug reactions, and eczema are among the top causes of admission. An important reason for inpatient care includes severe or extensive disease, sometimes leading to even hemodynamic instabilities, the need to observe top causes, describing immunomodulators or specialized investigations.[8]

Despite the considerable burden of inpatient dermatology in resource-limited settings, there is a scarcity of published data from Pakistan, particularly from tertiary care hospitals. This study was therefore undertaken to analyze the frequency and relationship to length of stay and demographic variables of dermatology inpatients at a tertiary care center in Pakistan.

Materials and Methods

We conducted a retrospective record review study of all dermatology inpatient admissions between January 2023 and December 2024 at the dermatology ward, Benazir Bhutto Hospital, Rawalpindi, in Pakistan. Admission and discharge records were reviewed from the department's inpatient registry and hospital medical records system. Missing data was left out, no imputations were made, Sample technique was consecutive non-probability sampling.

Inclusion criteria were 1) record review of all patients admitted to the Dermatology ward, and 2) admission within the study period. Exclusion criteria were 1) OPD patients, 2) non-dermatological patients in case of stay, and 3) patients' files that were not in the study period.

For each patient, data were collected on demographic variables (age, sex), clinical diagnosis at admission, associated complications, referrals to other specialties, duration of hospital stay, and mortality. Data completeness was ensured through cross-verification with both ward registers and electronic health records.

Data was entered into Microsoft Excel and analyzed using descriptive statistics. Continuous variables (e.g., age, duration of stay) were expressed as mean ± standard deviation (SD) or median (interquartile range, IQR) where appropriate, while categorical variables (e.g., sex, diagnosis, outcome) were presented as frequencies and percentages. For inferential statistics, the Chi-square test was done for categorical variables, the Student's T-test, and the Wilcoxon Rank-sum test were used depending on normality and homogeneity of variance (checked by Levene's test). No imputation method was used for completing missing data. The alpha level of rejection was set to ≤ 0.05. R Statistical language (version 4.4.2; R Core Team, 2024) was used for the analysis.

Results

Total inpatients for the study period from 1st January 2023 to 31st December 2024 were 371, as obtained from the records of Benazir Bhutto Hospital, Rawalpindi, male being 188 (50.81%) and female being 182 (49.19%). Mean age and SD were 39.43 ± 15.77. Length of stay in days and mortality with demographics are given in Table 1.

Table 1: *Demographic Details of Patients*

Demographics and Characteristics	N	N (%)[1]
Age	336	
Mean (SD)		39.43 (15.77)
Min, Max		3.00, 84.00
Gender	370	
Female		182 (49.19%)
Male		188 (50.81%)
Length of Hospital Stay (in days)	362	
Median (Q1, Q3)		7.00 (3.00, 15.00)
Mean ± SD		10.19 ± 9.77
Shifted To Medical Ward	371	3 (0.81%)
Leave Against Medical Advice	371	10 (2.70%)
Year	371	
2023		183 (49.33%)
2024		188 (50.67%)
Mortality	371	4 (1.08%)

Note. [1]N (%)

The most common causes of admission were psoriasis and autoimmune blistering dermatoses, with others being listed in Table 2 with hospital stay per disease, along with different frequencies and percentages. There was a total of 4 (1.08%) mortalities, 2 in 2023, 1 because of pemphigus vulgaris (sepsis leading to cardiopulmonary arrest), and others because of toxic epidermal necrolysis. There were 2 in 2024, the reason being sepsis with underlying pemphigus vulgaris. All these patients were shifted to the medical ICU, where they subsequently expired. There were no significant differences between age by gender ($p = 0.97$) or year ($p = 0.45$), and length of stay in days by gender ($p = 0.50$) and by year ($p = 0.22$). Statistical significance was found between gender differences between years ($p = 0.00183$), with fewer males, 77 (42.31%), in 2023 and more males, 110 (58.51%), in 2024 Figure 1. Figure 2 shows admission trends of the top 5 diseases in both years, with plaque psoriasis peaking near the winter seasons and autoimmune blistering dermatoses peaking mid-year.

Table 1 *Duration of Length of Hospital Stay by Diagnosis of Inpatients with Frequencies of Diagnosis.*

		Hospital Length of Stay (in days)		
Diagnosis	**N (%)[1]**	**Median**	**IQR[2]**	**Range**
Autoimmune Blistering Dermatoses	59 (15.86%)	11.0	4.50 - 16.00	(1.00, 45.00)
Plaque Psoriasis	58 (15.59%)	7.0	4.00 - 15.50	(1.00, 40.00)
Skin Infections (bacterial, fungal, viral, others)	52 (13.98%)	10.0	6.00 - 18.75	(1.00, 67.00)
Erythroderma	39 (10.48%)	7.0	3.00 - 12.50	(1.00, 60.00)
Chronic Eczema	34 (9.14%)	6.5	3.00 - 10.75	(1.00, 39.00)
Drug Reactions	26 (6.99%)	5.0	3.00 - 14.00	(1.00, 50.00)
Syphilis	15 (4.03%)	1.0	1.00 - 3.50	(1.00, 42.00)
Systemic Lupus Erythematosus	12 (3.23%)	10.5	6.75 - 13.75	(2.00, 19.00)
Vasculitis	11 (2.96%)	7.0	5.00 - 9.50	(4.00, 25.00)
Systemic Sclerosis	9 (2.42%)	5.0	2.00 - 15.00	(2.00, 24.00)
Pyoderma Gangrenosum	8 (2.15%)	8.0	6.00 - 12.50	(1.00, 17.00)
Epidermolysis bullosa	4 (1.08%)	4.0	1.75 - 8.50	(1.00, 16.00)
Skin Malignancy	4 (1.08%)	8.5	8.00 - 10.50	(8.00, 15.00)
Alopecia Universalis	3 (0.81%)	4.0	3.00 - 6.50	(2.00, 9.00)
Lichen Planus	3 (0.81%)	3.0	3.00 - 3.50	(3.00, 4.00)
Pustular Psoriasis	3 (0.81%)	8.0	5.00 - 9.50	(2.00, 11.00)
Acute Eczema	2 (0.54%)	6.0	5.00 - 7.00	(4.00, 8.00)

		Hospital Length of Stay (in days)		
Diagnosis	**N (%)[1]**	**Median**	**IQR[2]**	**Range**
Angioedema	2 (0.54%)	7.5	5.75 - 9.25	(4.00, 11.00)
Leg Ulcer	2 (0.54%)	12.5	11.25 - 13.75	(10.00, 15.00)
Mixed Connective Tissue Disease	2 (0.54%)	10.5	6.25 - 14.75	(2.00, 19.00)
Palmoplantar Keratoderma	2 (0.54%)	8.0	4.50 - 11.50	(1.00, 15.00)
Prurigo Nodularis	2 (0.54%)	4.0	2.50 - 5.50	(1.00, 7.00)
Acute Generalized Exanthematous Pustulosis	1 (0.27%)	3.0	3.00 - 3.00	(3.00, 3.00)
Anaplastic Large Cell Lymphoma	1 (0.27%)	1.0	1.00 - 1.00	(1.00, 1.00)
Behcet's disease	1 (0.27%)	2.0	2.00 - 2.00	(2.00, 2.00)
Dermatomyositis	1 (0.27%)	3.0	3.00 - 3.00	(3.00, 3.00)
Ehlers-Danlos syndromes	1 (0.27%)	4.0	4.00 - 4.00	(4.00, 4.00)
Follicular Occlusion Tetrad	1 (0.27%)	20.0	20.00 - 20.00	(20.00, 20.00)
Gleich's syndrome	1 (0.27%)	6.0	6.00 - 6.00	(6.00, 6.00)
Gorlin Syndrome	1 (0.27%)	10.0	10.00 - 10.00	(10.00, 10.00)
Hidradenitis Suppurativa	1 (0.27%)	2.0	2.00 - 2.00	(2.00, 2.00)
Leukocytoclastic Vasculitis	1 (0.27%)	12.0	12.00 - 12.00	(12.00, 12.00)
Major Apthous Ulcer	1 (0.27%)	2.0	2.00 - 2.00	(2.00, 2.00)
Morphea	1 (0.27%)	5.0	5.00 - 5.00	(5.00, 5.00)
Viral Pharyngitis	1 (0.27%)	1.0	1.00 - 1.00	(1.00, 1.00)
Panniculitis	1 (0.27%)	1.0	1.00 - 1.00	(1.00, 1.00)
Porphyria	1 (0.27%)	6.0	6.00 - 6.00	(6.00, 6.00)
Ramsay Hunt Syndrome	1 (0.27%)	16.0	16.00 - 16.00	(16.00, 16.00)
Sarcoidosis	1 (0.27%)	5.0	5.00 - 5.00	(5.00, 5.00)
Scleroderma	1 (0.27%)	NA	NA - NA	(NA, NA)
Submandibular Swelling	1 (0.27%)	3.0	3.00 - 3.00	(3.00, 3.00)
Telogen Effluvium	1 (0.27%)	34.0	34.00 - 34.00	(34.00, 34.00)

Note. [1] N (%) indicates the number and percentage of patients admitted with each diagnosis.

[2] IQR represents the interquartile range.

[3] NA means Not Available

Figure 1: *Significantly more female admissions were in the year 2023 compared to the year 2024, which had significantly more male admissions.*

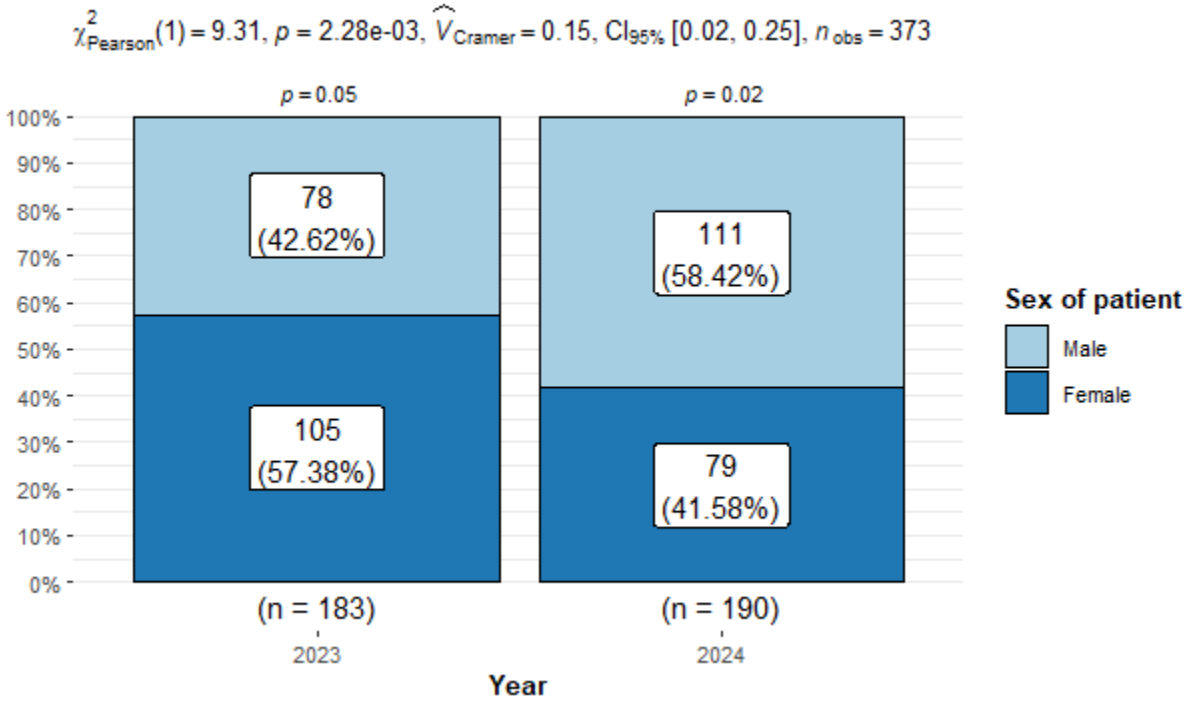

Figure 2, *2023 and 2024 Trend descriptives for the top 5 inpatient diseases. 2 separate line charts for 2023 (left) and 2024 (right) with different colors of lines per 5 diseases as shown.*

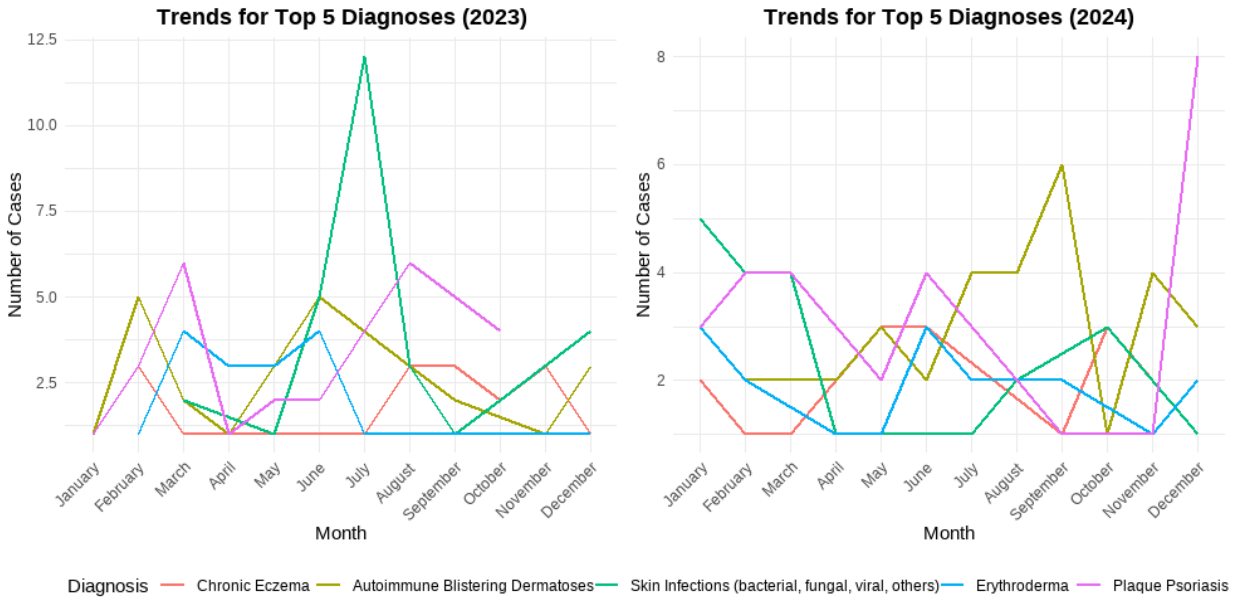

Table 2 *Frequencies and percentages of all the infectious diseases causing hospital admission in the study.*

Variables	N = 374[1]
Cutaneous Leishmaniasis	29 (7.80%)
Bacterial Skin Infections	11 (2.96%)
Fungal Skin Infections	5 (1.34%)
Viral Skin Infections	4 (1.08%)
Parasitic Skin Infections	1 (0.27%)
Cutaneous Tuberculosis	1 (0.27%)
Scabies	1 (0.27%)

Note. [1]n (%)

Discussion

During a span of two years, a total of 371 patients were admitted. There were 51.81% males and 49.19% females. Table 1. This equal preponderance is unlike a study in Pakistan that showed 94% patients to be male.[8] The mean age of our patients was 40 years, close to a study in Iran (44 years),[9]

The most common cause of admission in our study was immunobullous disorders, 59 (15.86%), followed by severe psoriasis, 58 (15.59%), and different infective disorders, 52 (13.98%) Table 2. The most common immunobullous disorder was pemphigus vulgaris, similar to a study conducted by Sen et al in India.[13] Other immunobullous disorders noted were Bullous pemphigoid and pemphigus foliaceus. Immunobullous disorders were also the most common cause of admission in an Iranian study.[9] This consistently high burden of autoimmune blistering diseases in South Asian tertiary centers highlights a distinct epidemiological pattern compared to Western populations, likely attributable to genetic susceptibility and environmental factors.[16] Extensive and severe forms of plaque psoriasis were the second most common cause of admission. It included patients who needed workups and interdepartmental liaison before starting immunomodulators or Biologics. Also, Benazir Bhutto Hospital is the only public sector hospital in the Rawalpindi district with the facility of UVB laser; thus, a few patients from far-flung areas had to be admitted for these purposes. As it is also a teaching hospital affiliated with the Rawalpindi Medical University, such patients were also admitted for teaching and training purposes. Recent global data similarly reflect that, despite the advent of potent outpatient biologics, hospitalization remains crucial for managing acute psoriatic flares and ensuring adherence to complex treatment regimens.[17]

Skin Infections were the third most common cause of admission in our series (13.98%), Table 2. Infectious conditions were the most frequent cause of indoor admission in Pakistan, [8%,] and 3.74% in Iran.[9] Cutaneous Leishmaniasis was

the most common infectious cause in dermatology admissions in our study, with 29 (7.80%) cases. This was followed by Bacterial Skin Infections at 11 (2.96%), Fungal Skin Infections 5 (1.34%), and Viral Skin Infections 4 (1.08%). Parasitic Skin Infections, Cutaneous Tuberculosis, and Scabies were the least common, each with 1 (0.27%) case, Table 3. Erythroderma secondary to various causes accounted for the fourth most common cause of admission, 39 (10.48%). The management of erythroderma demands a multidisciplinary approach for fluid balance and thermoregulation, often necessitating inpatient care to prevent metabolic complications, a finding supported by other tertiary care analyses.[18]

Chronic eczema accounted for 34 (9.14%) of cases. Table 2. It included chronic actinic dermatitis, airborne dermatitis, and adult-onset atopic dermatitis. Cutaneous adverse drug reactions (Stevens–Johnson syndrome - toxic epidermal necrolysis [TEN], drug hypersensitivity syndrome, exanthematous reaction) accounted for 26 (6.99%) of admissions in our study, close to the Indian study, where it was seen in 10 % of the patients. .[13]

The mean duration of hospital stays for our patients ranged (Mean ± SD = 10.19 ± 9.77), as shown in Table 1. About 267 patients (73.15%) stayed for <2 weeks, while 19 patients (5.21%) had to stay for more than a month. The mean duration of hospital stay was much higher when compared to the Western studies.[14,15] The longer duration of stay for our patients is mainly explained by, firstly, the most frequent reasons for admission: Immunobullous disorder, and secondly, the fact that patients who do not have access to primary care ignore their conditions till they become progressively worse. Conversely, efficient outpatient triage systems and day-care centers in developed healthcare systems have been shown to significantly reduce the average length of stay for similar dermatological conditions. [19]

The outcome of admitted patients was satisfactory, the mean mortality rate being 1.07% (1.09 in 2023 and 1.05 in 2024). This rate is even less than the Indian study, where it is 7%.[13] The majority of fatal cases were associated with Toxic Epidermal Necrolysis (TEN) and autoimmune blistering dermatoses. The highest disease-specific mortality rate was observed in TEN (3.85%, with 1 death out of 26 admissions), followed by autoimmune blistering dermatoses (3.39%, with 2 deaths out of 59), and erythroderma (2.56%, with 1 death out of 39). Advanced stages of disease at the time of admission and multiple comorbidities probably accounted for this high mortality rate in these patients. Most patients (360; 96.26%) benefitted from inpatient care and were advised regular outpatient follow-up, while 3 patients (0.8%) had to be transferred to other departments for management of their co-morbidities, and 11 (2.94%) left against medical advice. These figures are comparable to those reported in previous studies.[9,14]

Conclusion

Patients with several dermatological conditions require inpatient admission due to the severity of their disease and comorbidities. The conditions requiring admission vary from one geographic region to another and are beyond the scope of this study. Since many of the diseases are chronic in nature, they may require a prolonged hospital stay. Most of the admitted patients can benefit from inpatient care. Thus, there is a need for expansion of specialized dermatological inpatient facilities.

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