

Epidemiological Trends and Characteristics of Dermatological Conditions Presenting to a Saudi Major Emergency Department

Nouf F Bin Rubaian¹, Reem S AlOmar², Ahmed S Alzahrani³, Faleh M Alotaibi³, Mohammed A Alharbi³, Bader S Alanazi³, Serene R Almuheidib⁴, Nawaf F Alsaadoon⁵, Dunya Alfaraj⁶, Nouf A AlShamlan²

¹Dermatology Department, King Fahad Hospital of the University, Imam Abdulrahman Bin Faisal University, Dammam, Saudi Arabia; ²Department of Family and Community Medicine, College of Medicine, Imam Abdulrahman Bin Faisal University, Dammam, Saudi Arabia; ³College of Medicine, Imam Abdulrahman Bin Faisal University, Dammam, Saudi Arabia; ⁴Department of Dermatology, Dammam Medical Complex, Dammam, Saudi Arabia; ⁵Department of Emergency, King Fahad University Hospital, Al-Khobar, Saudi Arabia; ⁶Emergency Department, King Fahad Hospital of the University, Imam Abdulrahman Bin Faisal University, Dammam, Saudi Arabia

Correspondence: Nawaf F Alsaadoon, Department of Emergency, King Fahad University Hospital, Al-Khobar, Saudi Arabia, Email Nawafsaadoon@gmail.com

Background: Numerous dermatological conditions present in the emergency department (ED). Some have subtle presentations, yet most provoke patient suffering. Such conditions need to be identified and managed properly. This study aims to epidemiologically describe the patterns and characteristics of dermatological conditions presenting to a secondary teaching hospital's ED.

Methods: This retrospective chart review study analyses data on dermatological conditions that have presented to the ED between January 2021 and May 2023. The data gathered included sociodemographic variables, date and shift of visit, triage level, dermatological complaint characteristics, management, and discharge status. Comparative analysis was performed, and the level of significance was set at 0.05.

Results: The total number of cases was 301. The median age was 12 years (IQR = 4–30 years), with similar distribution between males and females (50.17% and 49.83% respectively). Most cases had presented to the ED during the morning shift (49.83%). Triage levels IV and V made up 94.69%, and only 5.32% belonged to triage level III. Most presented during the winter season (32.89%). The median visit duration was 312 minutes, and of all cases treated, only 10 required a return visit to the ED. Also, 41.53% were discharged and 58.47% required further management. Maculopapular rashes were the most common finding (35.55%). Bullae/blisters and erythroderma accounted for those that most often required further management. The two most prescribed medications were topical steroids and antihistamines, followed by emollients (32.09% and 15.81%, respectively). Viral infections were the most reported complaint (22.26%) and only two patients complained of erythema multiforme (0.66%).

Conclusion: This study found that the majority of cases could have been managed by family physicians at a primary care setting. Also, epidemiological seasonal variations were observed where the majority of patients requiring further management had presented during the autumn season.

Keywords: epidemiology, dermatology, emergency department

Introduction

In medical facilities, the Emergency Department (ED) is one of the settings most frequently utilised by patients, despite continuing issues with long waiting hours, crowded conditions, and extended times spent in treatment. All of these characteristics have negative consequences and are particularly common in Saudi Arabia, where the ED is still sometimes used as the primary point of entry into the healthcare system. Few epidemiological studies have explored ED visits for dermatology-related complaints. Dermatological complaints, like other chief complaints, are a major reason for ED visits. ED visits due to dermatological conditions vary worldwide, and some studies have revealed that

these conditions account for around 5–8% of all ED cases.¹ The Canadian Triage and Acuity Scale (CTAS), which is based on five levels, is a recognized and reliable tool used in EDs to manage and prioritise patients based on the severity of their condition. It ensures that seriously injured or critically ill patients receive care before less injured or ill individuals.²

Globally, most of the patients who presented to the ED had mild, non-urgent conditions that would have been better treated by a primary care physician.³ This result has also been documented in cases with dermatological problems brought to the ED. However, some dermatological conditions present in the ED are life-threatening if not managed promptly.⁴ Therefore, fast recognition of these conditions will result in reduced numbers of morbidity and mortality, along with hospital stay and cost. In a study that included 652 patients, it was found that dermatitis conditions were the major reason for a dermatology emergency visit. Moreover, forty percent of emergency visits occurred one week or more after onset of the dermatology complaint. The study concluded that there was a distinct difference between the cutaneous conditions of patients visiting the ED from the ones seen in a regular outpatient clinic.⁵ Dermatitis and ulcers were found to be the most common causes of admission, with ulcers being the cause for the longest hospital stay. Other studies in the literature reported similar findings.^{1,5–7}

There are few epidemiological studies, particularly from the Middle East region, that describe the characteristics of patients who attend the ED for dermatological consultations. The present study aimed to assess, epidemiologically, the characteristics and patterns of ED dermatological visits in a large university hospital in the Eastern Province of Saudi Arabia, as well as to determine their associations with discharge status.

Methodology

Ethics Approval and Consent to Participate

This study was approved by the Institutional Review Board of Imam Abdulrahman Bin Faisal University (IRB-2023-01-225). Administrative permission to access patients' records was sought from the ED. Since no identifying personal data was used, informed consent was not required. The study complied with the principles of the Declaration of Helsinki.

Study Setting and Design

This retrospective chart review study was conducted at King Fahd Hospital of the Imam Abdulrahman Bin Faisal University in the Eastern Province of Saudi Arabia. The hospital has adult and paediatric EDs, both covered by consultants and specialists, as well as rotating programme residents at different levels. The ER staff work in three shifts: the morning shift (7:00–15:00), the evening shift (15:00–23:00), and the night shift (23:00–7:00). For all other specialties, including dermatology, a 24-hour on-call schedule is provided monthly and covered by consultants, specialists, and residents.

Study Population

The study included all patients who presented to the ED for dermatology consultations, including adult and paediatric cases, between the 1st of January 2021 and the 31st of May 2023.

Data Collection

The variables included sociodemographic variables such as age, sex, nationality (Saudi vs non-Saudi), and marital status of the patient. Also noted were ED visit characteristics such as the date of the visit (month and year) and shift (morning, evening and night shifts), triage level of the visit according to the CTAS (I for resuscitation, II for emergent, III for urgent, IV for less urgent, and V for non-urgent), discharge status (discharged vs needed further management which included either admission or needed referral to OPD); revisit (yes/no); and visit duration in minutes. Other variables were characteristics of the dermatology complaint itself, including skin findings, site, dermatomes involved, medications prescribed, and the final chief complaint of the visit.

Statistical Analysis

Continuous variables were checked for normality and were subsequently described as medians and interquartile ranges (IQR). Categorical variables were described by frequencies and percentages. The outcome of the study was discharge status. Comparative analysis was performed through Chi-squared tests and Fisher's exact tests where the number of expected counts in cells was less than 5. For associations with the continuous variables, the Mann–Whitney *U*-test was performed. Due to non-significance, no logistic regression was performed. Levels of significance were set at 0.05. The Stata Statistical Software version 15.1 was used.

Results

Sociodemographic- and Dermatologically Related ED Visit Characteristics

The total number of visits for dermatology-related cases in the ED across the 29 months of the study between January 2021 and May 2023 was 301. Of those 301 visits, 58.47% required further management. The mean number of patients was 20.18 ± 20.83 , and due to the highly skewed nature of age, the median was reported as 12 years with an IQR of 4 to 30 years. The cases were very similarly distributed between males and females. The majority of cases were single and Saudi nationals. Around 50% of all cases presented to the ED during the morning shift, compared to only 14.62% during the night shift. No cases were classified as triage level I or II, and over 85% of cases were classified as triage IV compared to just 5.32% that were classified as triage level III. Most patients came to the ED during winter (32.89%) (Table 1).

Table 1 Sociodemographic- and Dermatologically Related Emergency Room Visit Characteristics

Characteristic	N (%) 301 (100.00)	Discharge Status N (%)		P-value
		Discharged 125 (41.53)	Further Management 176 (58.47)	
Age (Median, IQR)	12 (4, 30)	11 (4–28.5)	13 (4–32)	0.20
Sex				
Males	151 (50.17)	59 (39.07)	92 (60.93)	0.38
Females	150 (49.83)	66 (44.00)	84 (56.00)	
Marital status				
Single	282 (93.69)	121 (42.91)	161 (57.09)	
Married	18 (05.98)	4 (22.22)	14 (77.78)	
Widowed	1 (00.33)	0	1 (100.00)	
Nationality				0.18
Saudi	262 (87.04)	105 (40.08)	157 (59.92)	
Non-Saudi	39 (12.96)	20 (51.28)	19 (48.72)	
Shift				0.46
Morning	150 (49.83)	57 (38.00)	93 (62.00)	
Evening	107 (35.55)	48 (44.86)	59 (55.14)	
Night	44 (14.62)	20 (45.45)	24 (54.55)	

(Continued)

Table 1 (Continued).

Characteristic	N (%) 301 (100.00)	Discharge Status N (%)		P-value
		Discharged 125 (41.53)	Further Management 176 (58.47)	
Triage				0.06
III	16 (05.32)	4 (25.00)	12 (75.00)	
IV	260 (86.38)	106 (40.77)	154 (59.23)	
V	25 (08.31)	15 (60.00)	10 (40.00)	
Seasons				0.99
Winter	99 (32.89)	41 (41.41)	58 (58.59)	
Spring	85 (28.24)	35 (41.18)	50 (58.82)	
Summer	56 (18.60)	24 (42.86)	32 (57.14)	
Autumn	61 (20.27)	25 (40.98)	36 (59.02)	

With regards to associations with discharging status, patients who required further management had a 2-year-higher median age compared to those who were discharged. The need for further management was higher in males (60.93%), and patients presenting to the ED during the morning shift also represented a higher proportion of those requiring further management compared to those presenting during the night (62% and 54.55% respectively). The analysis also shows that patients who had a triage level of III required further management more than patients with a triage level of IV and V (75%, 59.23%, and 40% respectively). Most cases that required further management presented during the autumn season (59.02%). None of these associations were significant at the 0.05 level.

Characteristics of Dermatologically Related Conditions Presenting to the ED

Table 2 presents the conditions that patients presented with in the ED. Of the 301 patients seen, 35.55% presented with maculopapular rashes, followed by 9.97% of patients presenting with purpura and/or petechiae. Only four patients

Table 2 Characteristics of Dermatologically Related Conditions Presenting to the Emergency Room

Characteristic	N (%) 301 (100.00)	Discharge Status		P-value
		Discharged 125 (41.53)	Further Management 176 (58.47)	
Skin findings				0.24
Maculopapular rash	107 (35.55)	43 (40.19)	64 (59.81)	
Vesicles	25 (08.31)	9 (36.00)	16 (64.00)	
Urticaria with angioma	4 (01.33)	2 (50.00)	2 (50.00)	
Urticaria without angioma	26 (08.64)	12 (46.15)	14 (53.85)	
Bullae/blisters	6 (01.99)	1 (16.67)	5 (83.33)	
Erythroderma	8 (02.66)	2 (25.00)	6 (75.00)	
Purpura and/or petechiae	30 (09.97)	20 (66.67)	10 (33.33)	
Sloughing	5 (01.66)	2 (40.00)	3 (60.00)	

(Continued)

Table 2 (Continued).

Characteristic	N (%) 301 (100.00)	Discharge Status		P-value
		Discharged 125 (41.53)	Further Management 176 (58.47)	
Papulosquamous rash	6 (01.99)	2 (33.33)	4 (66.67)	
Others	27 (08.97)	32 (38.10)	52 (61.90)	
Site				0.03
Face	29 (09.63)	12 (41.38)	17 (58.62)	
Trunk	42 (13.95)	10 (23.81)	32 (76.19)	
Arm	17 (05.65)	7 (41.18)	10 (58.82)	
Leg	47 (15.61)	27 (57.45)	20 (42.55)	
Multiple	166 (55.15)	69 (41.57)	97 (58.43)	
Visit duration (Minutes)	312 (121, 679)	248 (75–679)	333 (163.5–673)	0.12
Revisit				
No	291 (96.68)	120 (41.24)	171 (58.76)	0.74
Yes	10 (03.32)	5 (50.00)	5 (50.00)	

presented with urticaria with angioma, representing 1.33%. Of all the patients, over half had dermatological lesions in multiple body sites, followed by the legs alone in 15.61% of the patients. Only 5.65% presented with lesions on the arms. The median visit duration was 312 minutes, and only 10 patients required a revisit to the ED.

When examining these factors with discharge status, the skin finding that most required further management was bullae/blisters (83.33%) followed by erythroderma (75%). Whereas only 33.33% of patients presenting with purpura and/or petechiae required further management, patients who required further management had a much higher median visit duration compared to those who were discharged (333 and 248 minutes respectively). Patients with lesions on the trunk were seen to need further management when compared to all other sites (76.19%). This was the only statistically significant association (P-value = 0.03).

Medications Prescribed to ED Patients Presenting with Dermatologically Related Conditions

The list of medications prescribed to patients presenting to the ED with dermatological complaints is presented in Table 3. Some patients had multiple medications prescribed; hence, the number exceeds 301. The two most prescribed medications were topical steroids and antihistamines (32.09%), followed by 15.81% emollients. Topical steroid-sparing and systemic antiparasitics were the least frequently ordered prescribed medications at just 0.47%.

Patterns of ED Visits of Patients Presenting with Dermatologically Related Conditions

The patterns of visits to the ED for the months between January 2021 and May 2023 are presented in Figure 1. For all years, the pattern revealed increases during March and April and decreases in May and June. The pattern then gradually increases again in August and September. The peaks during spring and summer were mostly pityriasis rosea diagnoses and viral exanthema in spring and burns during the summer.

Table 3 Medications Prescribed to Patients Presenting to the Emergency Room with Dermatologically Related Conditions

Prescribed Medications	N (%) 354 (164.65%)*
Topical steroids	69 (32.09)
Antihistamines	69 (32.09)
Emollients	34 (15.81)
Systematic antibiotics	28 (13.02)
Topical antibiotics	25 (11.63)
Topical antifungals	25 (11.63)
Systemic steroids	23 (10.70)
Antipyretics	23 (10.70)
Miscellaneous	22 (10.23)
Systemic antivirals	7 (03.26)
Systemic antifungals	6 (02.79)
Epinephrine	6 (02.79)
Combined topical steroids and antifungals	5 (02.33)
Painkillers	5 (02.33)
Combined topical steroids and antibiotic	3 (01.40)
Topical antiparasitic	2 (00.93)
Topical steroid sparing	1 (00.47)
Systemic antiparasitic	1 (00.47)

Note: *Numbers do not total 100.00% due to multiple prescriptions being ordered.

Chief Complaint of Patients Presenting to the ER with Dermatologically Related Conditions

Of the 301 patients seen, the most commonly reported complaint was viral infections in 22.26% of the patients, encompassing herpes zoster, hand foot mouth disease, eczema herpeticum, chickenpox, roseola infantum, genital herpes, pityriasis rosea, monkey pox, molluscum contagiosum, and gianotti crosti syndrome. While miscellaneous complaints represented 21.59% and eczema represented 19.94%. Fungal infections included majocchi granuloma, tinea corporis, candidal intertrigo, tinea capitis, pityriasis versicolor and tinea pedis. The least commonly reported complaint was erythema multiforme, which is a mucous-cutaneous immune-mediated condition characterised by target lesions and was found in just 2 patients amounting to 0.66% of all cases. Examining these complaints by discharge status, erythema multiforme and vasculitis were both found to require further management, while patients with urticaria and eczema were mostly discharged (Figure 2).

Distribution of Visits According to Sex and Season

Figure 3 shows the distribution of visits according to sex and season. During the winter season, females were seen more frequently than males.

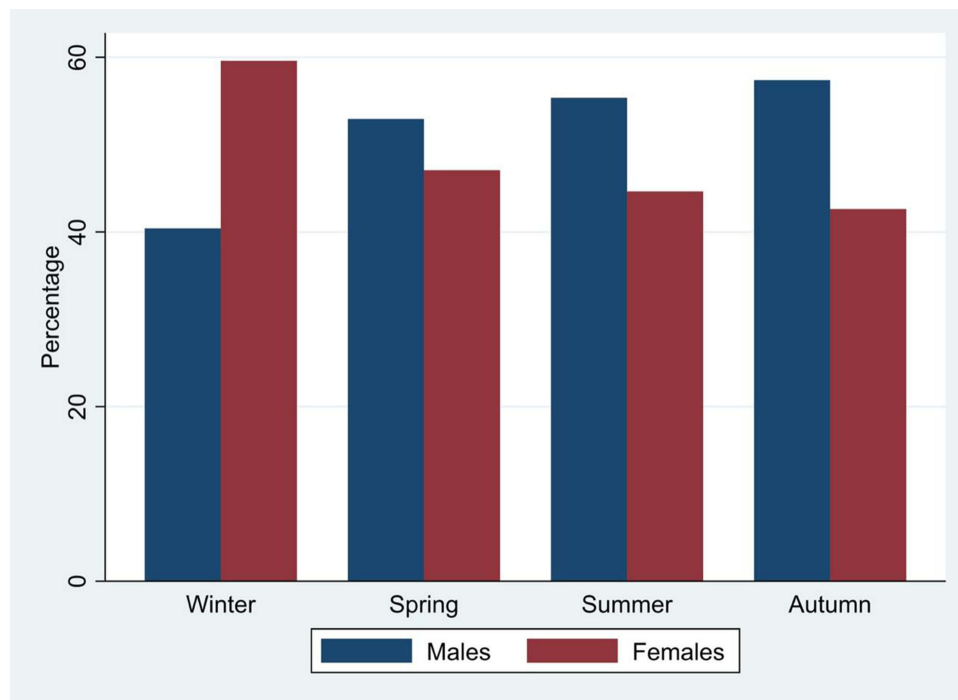


Figure 1 Pattern of ER visits of patients presenting with dermatologically related conditions.

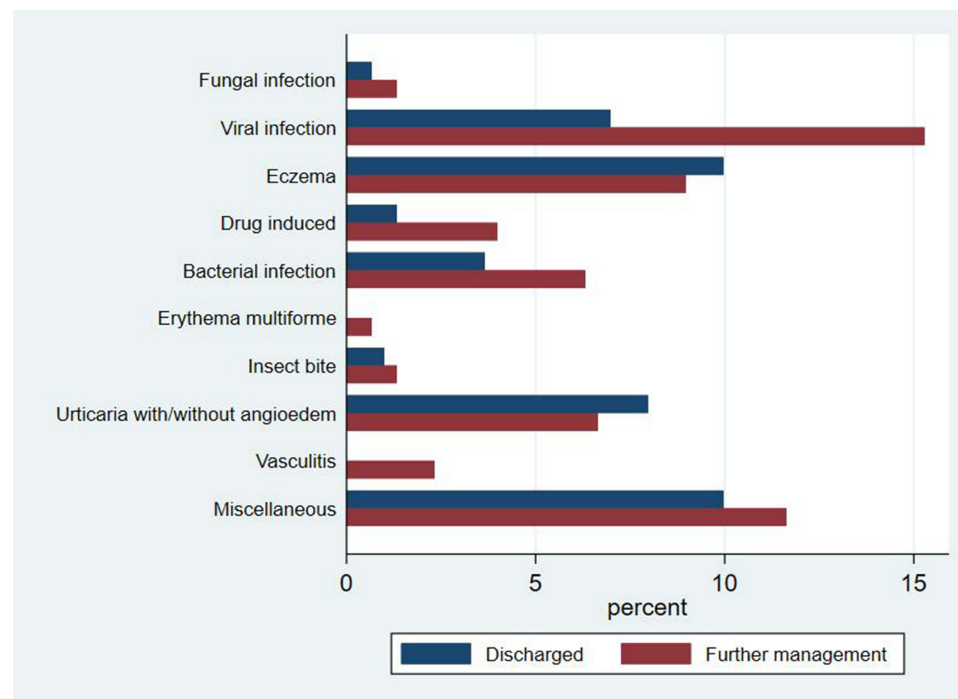


Figure 2 Chief complaints of patients presenting to the ER with dermatological conditions and their discharge status.

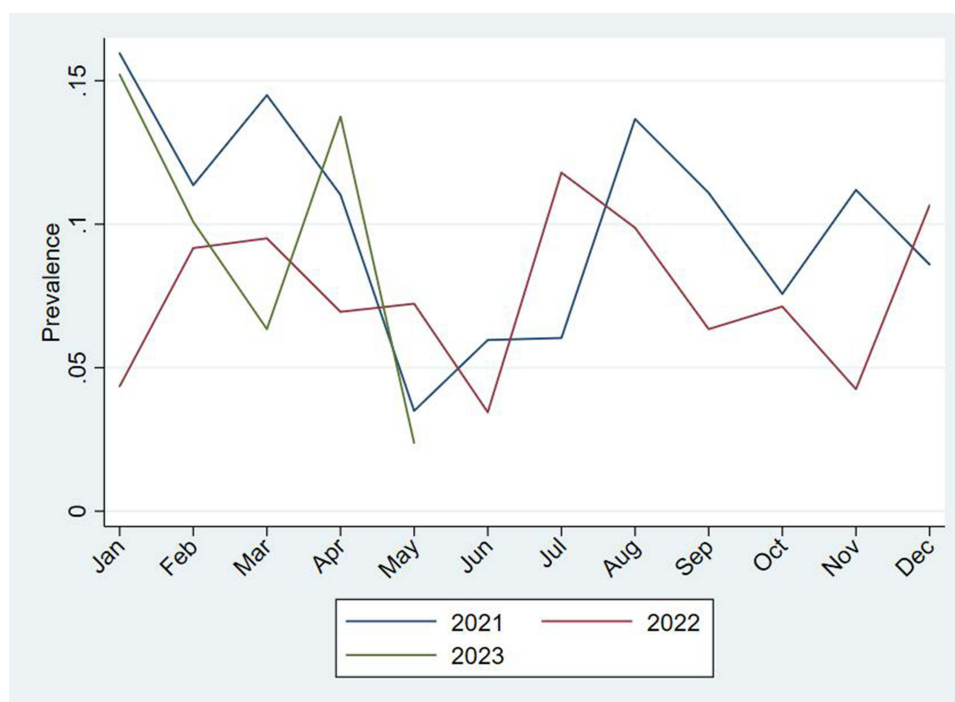


Figure 3 Distribution of visits by sex and season.

Subgroup Analyses of Patients with Herpes Zoster

Subgroup analysis of patients with herpes zoster found that only 14 cases presented to the ED, with equal numbers of males and females. The median age was 41 years and the IQR was 32 to 56 years. Only 1 of these patients was given a triage level of III, with the other 13 patients at a triage level IV. Of these 14 patients, 8 presented to the ED during spring (57.14%), 3 during winter, and 3 during summer (21.43% and 21.43% respectively). None were seen in autumn. Also, of these patients, 10 (71.43%) had one dermatome.

Discussion

The study's findings provide epidemiologically insightful observations about the characteristics of patients, the patterns of their dermatological complaints, and the management of their conditions in the ED. This will facilitate convenient management of these conditions by dermatologists and other healthcare providers such as emergency and primary care physicians, who often serve as the initial point of contact for patients.

In the current study, the majority of ED cases with dermatological complaints were categorized as less urgent; only 5.32% of cases were identified as triage level III. None of the cases were assigned a triage level I or II. This is consistent with earlier Saudi research that highlighted the problem of non-urgent cases using ED services when they should be managed by primary health care.³ The country's higher authorities placed a greater emphasis on primary healthcare services and paid particular attention to how the healthcare system should be utilised. The current study's findings urge healthcare system policymakers to continue monitoring this problem and address any potential obstacles that might prevent non-urgent cases from using primary healthcare services in the country.⁸

Interestingly, two peaks of dermatological cases presented to the ED were noted in our study, outlining the seasonal variation of dermatological condition presentations. Peaks were observed during the summer and spring seasons, though the bulk of patients who required further management presented during autumn. This peak of cases during the summer season has previously been reflected in the literature from different countries. An Australian study found that most cases arrived in the summer, and most of those cases were discharged as non-urgent cases.⁹ Summer peaks were also noticed in a Canadian study in which the authors suggested that presentation may be related to seasonal factors such as increasing heat, humidity, insect bites, and the high frequency of outdoor activities.¹⁰ A Korean study found a striking increase in

the number of dermatological cases during the summer season.¹¹ In our study, the peak in summer can be explained by the weather in the Eastern Province of Saudi Arabia, which is one of the hottest and most humid areas in the country. To our knowledge, a peak during the spring season was observed in our study alone. This may be attributed to geographical differences between the Eastern Province and the areas documented in the earlier literature. Understanding the seasonal variations of dermatological conditions can be beneficial for emergency physicians and dermatologists. It allows them to anticipate and prepare for higher incidences of specific dermatological conditions during certain times of the year.

The majority of cases in our study presented to the ED during the morning shift. This finding is similar to a study done in the emergency dermatological unit at a university hospital in Germany, where most cases were registered in the morning. Over 85% of cases were categorized as less urgent, and no emergency cases were encountered. This finding is similar to previously published articles.^{9,10,12} Patients in our study reported long waiting time by an ED physician, and this can be attributed to the fact that most dermatological complaints are less urgent. This theory is supported by our findings, where the median visit duration was 312 minutes. Patients who needed further management had a significantly longer median visit duration compared to those who were discharged.

With regards to discharge status, Bullae and/or blisters followed by erythroderma were the most common skin findings that required further management, while most patients with urticaria and eczema were discharged.

The most frequently encountered complaints in our study were viral infection and eczema, accounting for 22.26% and 19.94%, respectively. This is similar to previous literature in which cutaneous infections and eczema were the top diagnoses.^{5,11,13–15} Herpes zoster was diagnosed in 4.65% of the cases, which is similar to percentages reported in other studies.^{6,11–13,16,17} Conversely, a study conducted in Singapore found that herpes zoster and chickenpox were the most common dermatological complaints, representing 20.8%.¹⁸

The most frequently prescribed medications for patients presenting to the ED with dermatologically related conditions were topical steroids and antihistamines, which were each prescribed with the same frequency in 32.09% of cases. Emollients were prescribed in 15.81% of cases, followed by systemic and topical antibiotics. A similar study conducted in Switzerland also found that topical steroids and emollients were the most commonly prescribed medications. Additionally, our study showed a higher use of topical medications compared to systemic treatments, which is consistent with the findings of the Swiss study.¹⁸ A limited number of studies have explored the most commonly used drugs in emergency settings for dermatological cases. Understanding the medications prescribed in these cases can help identify appropriate usage for specific dermatological conditions.

Associations between patients' sex and the seasons of their presentation to the ED were assessed in the present study. An interesting finding for women's health experts is that during the winter season, females were seen more frequently than males. There is not much information to explain this observation, leaving the question open for further investigation.

The limitation of our study was that not all patients were seen by an on-call dermatologist nor seen in an outpatient dermatology clinic, which might have changed case management compared with ED personnel's decisions alone. Another limitation is that the study was conducted in just one hospital, which may impact the sample size as per patient eligibility.

Conclusion

Over 40% of ED patients with dermatological conditions were discharged without further management. Epidemiologically, seasonal variations were observed. Dermatologists and other medical professionals who provide primary care to patients—such as family and emergency physicians—may find the study's findings useful in understanding this. Moreover, the vast majority of cases in the ED were not as urgent. Because numerous situations would be more effectively addressed by primary healthcare facilities, this study further highlights the issue of inappropriate usage of ED services. It is recommended that more qualitative research be conducted to evaluate patients' perspectives on using ED services for dermatological problems.

Disclosure

The authors report non conflicts of interest in this work.

References

1. Kilic D, Yigit O, Kilic T, Buyurgan CS, Dicle O. Epidemiologic characteristics of patients admitted to emergency department with dermatological complaints; a retrospective cross-sectional study. *Arch Acad Emerg Med.* 2019;7(1):e47. PMID: 31602430; PMCID: PMC6785214.
2. Lee JY, Oh SH, Peck EH, et al. The validity of the Canadian triage and acuity scale in predicting resource utilization and the need for immediate life-saving interventions in elderly emergency department patients. *Scand J Trauma Resusc Emerg Med.* 2011;19(68). doi:10.1186/1757-7241-19-68
3. Al-Qahtani MH, Yousef AA, Awary BH, et al. Characteristics of visits and predictors of admission from a paediatric emergency room in Saudi Arabia. *BMC Emerg Med.* 2021;21(72). doi:10.1186/s12873-021-00467-7
4. Bertanha F, Nelumba EJP, Freiberg AK, Samorano LP, Festa Neto C. Profile of patients admitted to a triage dermatology clinic at a tertiary hospital in São Paulo, Brazil. *Anais Brasileiros De Dermatologia.* 2016;91(3):318–325. doi:10.1590/abd1806-4841.20164495
5. Pelloni L, Cazzaniga S, Naldi L, Borradori L, Mainetti C. Emergency consultations in dermatology in a secondary referral hospital in Southern Switzerland: a prospective cross-sectional analysis. *Dermatology.* 2019;235(3):243–249. doi:10.1159/000498850
6. Ruzza N, Itin P, Beltraminelli H. Urgent consultations at the dermatology department of Basel University Hospital, Switzerland: characterisation of patients and setting - A 12-month study with 2222 patients data and review of the literature. *Dermatology.* 2014;228(2):177–182. doi:10.1159/000357532
7. Abedini R, Matinfar A, Sasani P, Salehi A, Daneshpazhooh M. Evaluation of patients visiting the dermatology emergency unit of a university dermatology hospital in Tehran, Iran. *Acta Med Iran.* 2018;55(11):705–711.
8. AlOmar RS, AlShamlan NA, AlAmer NA, et al. Perceived barriers to primary care services utilization and its associations with overall satisfaction of patients in Saudi Arabia: a cross-sectional questionnaire-based study. *J Prim Care Community Health.* 2021;12:21501327211014065. doi:10.1177/21501327211014065 PMID: 33957808; PMCID: PMC8114241.
9. Shao E, Judge C, McMeniman E, et al. Presenting patterns of dermatology conditions to an Australian emergency department. *World J Emerg Med.* 2020;11:74. doi:10.5847/wjem.j.1920-8642.2020.02.002
10. Baibergenova A, Shear NH. Skin conditions that bring patients to emergency departments. *Arch Dermatol.* 2011;147:118. doi:10.1001/archdermatol.2010.246
11. Kim JY, Cho HH, Hong JS, et al. Skin conditions presenting in emergency room in Korea: an eight-year retrospective analysis. *Acad Dermatol Venereol.* 2013;27:479–485. doi:10.1111/j.1468-3083.2012.04469.x
12. Lai-Kwon J, Weiland TJ, Chong AH, et al. Which dermatological conditions present to an emergency department in Australia? *Emerg Med Int.* 2014;2014:1–4. doi:10.1155/2014/463026
13. Bancalari-Díaz D, Gimeno-Mateos LI, Cañueto J, et al. Dermatologic emergencies in a tertiary hospital: a descriptive study. *Actas Dermo-Sifiliográficas.* 2016;107:666–673. doi:10.1016/j.ad.2016.05.001
14. Rubegni P, Cevenini G, Lamberti A, et al. Dermatological conditions presenting at the emergency department in Siena University Hospital from 2006 to 2011. *Acad Dermatol Venereol.* 2015;29:164–168. doi:10.1111/jdv.12513
15. Symvoulakis EK, Krasagakis K, Komninos ID, et al. Primary care and pattern of skin diseases in a Mediterranean island. *BMC Fam Pract.* 2006;7:6. doi:10.1186/1471-2296-7-6
16. Alpalhão M, Uva L, Soromenho G, et al. Dermatological emergencies: one-year data analysis of 8620 patients from the largest Portuguese tertiary teaching hospital. *Eur J Dermatol.* 2016;26:460–464. doi:10.1684/ejd.2016.2825
17. Bahamdan KA, Egere JU, Khare AK, et al. The pattern of skin diseases in Asir Region, Saudi Arabia: a 12-month prospective study in a referral hospital. *Ann Saudi Med.* 1995;15:455–457. doi:10.5144/0256-4947.1995.455
18. Wang E, Lim BL, Than KY. Dermatological conditions presenting at an emergency department in Singapore. *Singapore Med J.* 2009;50:881–884.

Open Access Emergency Medicine

Dovepress

Publish your work in this journal

The Open Access Emergency Medicine is an international, peer-reviewed, open access journal publishing original research, reports, editorials, reviews and commentaries on all aspects of emergency medicine. The manuscript management system is completely online and includes a very quick and fair peer-review system, which is all easy to use. Visit <http://www.dovepress.com/testimonials.php> to read real quotes from published authors.

Submit your manuscript here: <https://www.dovepress.com/open-access-emergency-medicine-journal>