

Comparative Evaluation of Dermatological Emergency Consultations in the Coronavirus Pandemic Era: Tertiary Clinic Experience

Berkay Temel¹, Ozge Mine Orenay¹, Nermin Karaosmanoglu¹

¹ Department of Dermatology, Ministry of Health, Ankara Training and Research Hospital, Ankara, Turkey

Key words: covid, consultation, emergency, dermatology

Citation: Temel B, Orenay OM, Karaosmanoglu N. Comparative evaluation of dermatological emergency consultations in the coronavirus pandemic era: Tertiary clinic experience. *Dermatol Pract Concept*. 2023;13(1):e20230112. DOI: <https://doi.org/10.5826/dpc.1301a112>

Accepted: June 16, 2022; **Published:** January 2023

Copyright: ©2023 Temel et al. This is an open-access article distributed under the terms of the Creative Commons Attribution-NonCommercial License (BY-NC-4.0), <https://creativecommons.org/licenses/by-nc/4.0/>, which permits unrestricted noncommercial use, distribution, and reproduction in any medium, provided the original authors and source are credited.

Funding: None.

Competing Interests: None.

Authorship: All authors have contributed significantly to this publication.

Corresponding Author: Berkay Temel, MD, Adress: Department of Dermatology, Ministry of Health, Ankara Training and Research, Hospital. Sakarya Mahallesi, 89, Ulucanlar Caddesi, 06230, Altındağ/ Ankara, Turkey. Phone number: +905058190789
E-mail: berkaytemel42@gmail.com

ABSTRACT **Introduction:** Due to the increase in COVID-19 patients during the pandemic, the workload of emergency departments has increased. The profile of patients seeking non-COVID medical care has changed significantly because of the pandemic; this includes dermatological emergencies.

Objective: The aim was to evaluate and compare adult dermatological emergency consultations during the COVID-19 period with the pre-pandemic period.

Methods: Consulted patients from ED to dermatology between March 11, 2019, and March 11, 2021 were included (Pre-pandemic and pandemic). Age, gender, zone of triage, consultation hour, consultation date, consultation response time, ICD-10 codes were recorded.

Results: The total number of consultations was 639. The mean age of the patients was 44.4 in the pre-pandemic period and 46.1 in the pandemic period. The mean consultation response time was 44.4 minutes in the pre-pandemic period and 60.3 minutes in the pandemic. In the pre-pandemic period, the most common consulted diseases were herpes zoster, urticaria, and allergic contact dermatitis. During the pandemic, the most common consulted diseases were herpes zoster, other dermatitis, and urticaria. There was a statistically significant difference in the incidence of other dermatitis, impetigo/folliculitis, cutaneous vasculitis, and pruritus ($p < 0.05$)

Conclusions: Emergency departments are the busiest and fastest areas of the hospital. Pandemics such as COVID-19 may also occur in the coming years. Informing society about dermatological emergencies and adding adequate dermatology training to the training of emergency physicians will facilitate appropriate patient management in emergency departments.

Introduction

On March 11, 2020, the World Health Organization declared the Coronavirus disease 19 (COVID-19) outbreak as a pandemic, reporting more than 118,000 cases and 4,291 deaths in 114 countries [1]. The rapid spread of COVID-19 all over the world hit health systems hard and prompted many countries to take various measures that aimed to limit the spread of the virus and reduce the number of patients and deaths [2]. The health system, which was rebuilt under the influence of the pandemic, affected every medical department including the dermatology and emergency departments (ED). Almost most of the dermatology inpatient services were reserved for COVID-19 patients, and the number of patients in dermatology outpatient clinics was restricted by health authorities to reduce the spread of the virus [3]. Therefore, the number of dermatologic patients who applied to clinics during the pandemic period decreased, and in addition to this decrease, fear of contracting COVID-19 and skin conditions related to COVID-19 (vesicular eruptions, petechial/purpuric rashes, acral lesions, livedoid lesions, urticarial rash, and maculopapular-erythematous rash) changed the profile of faced dermatological diseases [3-5].

During the pandemic, many COVID-19 patients were first evaluated in hospital EDs. Because of this, the workload in ED increased significantly. There have been many studies investigating the impact of the pandemic on the ED. These studies showed that the number of non-COVID-19 patients admitted to the ED decreased and their disease profiles changed [6,7]. Despite these studies, studies on dermatological diseases consulted from emergency services were limited [8,9]. This study aimed to evaluate adult dermatological emergency consultations during the COVID-19 period and to compare them with the pre-pandemic period.

Material and Methods

Study Design, Patient Selection and Variables

Patients who were consulted to the dermatology clinic by the adult emergency department between March 11, 2020, and March 11, 2021 (pandemic period) and the same dates of the previous year (pre-pandemic period) were included in this study. The dividing point for the pre-pandemic and pandemic period was chosen on March 11, 2020, the day when COVID-19 was declared as a pandemic all over the world. This study was conducted in the Dermatology Clinic of Ankara Training and Research Hospital, which is a tertiary clinic in Turkey. Local ethical approval was obtained for this study. Age, gender, zone of triage, consultation hour, consultation date, consultation response time, and International Classification of Diseases, Tenth Revision (ICD-10) codes were recorded from hospital electronic medical records.

Zone of triage was determined as green (simple health conditions that present as an outpatient, are stable in general condition and can be treated on an outpatient basis), yellow (conditions with potentially life-threatening, risk of limb loss and significant morbidity) red (conditions that are life-threatening and require a rapid aggressive approach and urgent simultaneous evaluation and treatment). In our center, consultations requested from the adult emergency between 08:00 and 16:00 are evaluated in outpatient clinics. Between 16.00-08.00, a doctor is assigned to the inpatient clinic for consultation. Consultation time was divided into three time periods 08.00-16.00, 16.00-00.00, and 00.00-08.00. The consulted diseases were classified according to ICD-10 codes. These were dermatitis, infection diseases, hypersensitivity diseases, inflammatory diseases, autoimmune bullous disease, and others. The subgroup disease profile was also determined under these headings one by one. Bullous disorders with extensive involvement, angioedema, erythroderma, toxic epidermal necrolysis, Steven Johnson's syndrome, pustular psoriasis with metabolic complications were accepted as true dermatological emergencies [10]. These data were evaluated and compared according to pre-pandemic and pandemic periods retrospectively.

Statistical Analysis

Research data was evaluated via Statistical Package for the Social Sciences (SPSS.22, IBM SPSS Statistics for Windows, Version 22.0. Armonk, New York: IBM Corp.). Descriptive statistics were recorded as mean (\pm) standard deviation, frequency distribution, and percentage. Normality analyses of the data were carried out with the Shapiro-Wilk test. For categorical variables, whether there is a difference in frequency between groups was compared using Pearson chi-square. The t-test was used to evaluate normally distributed means. Mann-Whitney U test was used to evaluate not normally distributed means. The statistical significance value of this study was accepted as $p < 0.05$.

Results

Main Characteristics of Pre-Pandemic and Pandemic Period Consultations

The total number of consultations during the pre-pandemic and pandemic period was 639. It was determined that 467 consultations were requested in the pre-pandemic 1-year period, while 172 consultations were requested in the pandemic 1-year period. It was found that consultations decreased by 63.1% during the pandemic period. The mean age of the patients in the pre-pandemic period was calculated as 44.4 ± 18.6 . In the pandemic period, the mean age was calculated as 46.1 ± 18.2 . There was no statistically significant difference between the periods in terms of mean age ($p = 0.31$)

(Table 1). 47.3% (n=221) of the patients evaluated in the pre-pandemic period were male and 52.7% (n=246) were female. During the pandemic period, 51.2% (n=88) were men and 48.8% (n=84) were women. There was no statistically significant difference in terms of gender (p=0.38) (Table 1). In the pre-pandemic period, 40.3% (n=18) of the consultations were requested from the green zone, 50.7% (n=237) from the yellow zone and 9% (n=42) from the red zone. In the pandemic period, 25% (n=43) were requested from the green zone, 64.5% (n=111) from the yellow zone and 10.5% (n=18) from the red zone. There was a statistically significant difference between the periods in terms of green and yellow triage zones (p=0.01) (Table 1).

In the pre-pandemic period, 40% (n=187) of the consultations were requested between 08.00- 16.00, 51.2% (n=239) between 16.00-00.00 and 8.8% (n=41) between 00.00-08.00. In the pandemic period, 45.9% (n=79) of the consultations were requested between 08.00-16.00, 41.3% (n=71) between 16.00-00.00 and 12.8% (n=22) between 00.00-08.00. There was a statistically significant difference between the periods in terms of 16.00-00.00 consultation time (p=0.04) (Table 1). The mean consultation response time in the pre-pandemic period was 44.4 minutes. It was 60.3 minutes during the pandemic period. There was no statistically significant difference between the periods in terms of consultation response time (p=0.52) (Table 1). 6 (1.3%) of the patients in the pre-pandemic period and 1 (0.6%) of the patients in the pandemic period were hospitalized. There was no statistically significant difference between the periods in terms of hospitalization rates (p=0.34) (Table 1). In the pre-pandemic period, consultation was most requested

in August 2019 (n=55) and least in September 2019 (n=25). During the pandemic period, consultation was most requested in July 2020 (n=35) and least in January 2021 (n=2) (Figure 1).

Comparison of Pre-Pandemic and Pandemic Period Disease Profiles

In the pre-pandemic period, the three most commonly consulted diseases were herpes zoster, urticaria, and allergic contact dermatitis. In the pandemic period, the three most consulted diseases were herpes zoster, other dermatitis, and urticaria. There was a statistically significant difference between the periods in terms of the incidence of other dermatitis, impetigo/folliculitis, cutaneous vasculitis, and pruritus (p=0.01, 0.02, 0.03, 0.01) (Table 2). True dermatological emergencies were detected in 37 (7.9%) patients in the pre-pandemic period and 13 (7.6%) patients in the pandemic period. There was no statistically significant difference between the periods in terms of dermatological emergencies (p=0.86) (Table 1).

Discussion

The COVID-19 pandemic has deeply affected the health system of every country. During the pandemic period, emergency departments became the first points of contact for COVID-19 patients. Therefore, the number and profile of non-COVID-19 patients admitted to the emergency department changed. In this study, the dermatology consultations requested from the adult emergency department during the pandemic period were examined and compared with the pre-pandemic period.

Table 1. Characteristics of study.

	Pre-Pandemic (n=467)	Pandemic (n=172)	pvalue
Age, mean ±Std	44.4±18.6	46.1±18.2	0.31*
Gender, n (%)			0.38**
Male	221 (47.3)	88 (51.2)	
Female	246 (52.7)	84 (48.8)	
Triage Zones, n (%)			0.01**
Green	118 (40.3)a	43 (25)b	<0.05
Yellow	237 (50.7)a	111 (64.5)b	<0.05
Red	42 (9)a	18 (10.5)a	>0.05
Consultation time			0.04**
08.00-16.00	187 (40)a	79 (45.9)a	>0.05
16.00-00.00	239 (51.2)a	71 (41.3)b	<0.05
00.00-08.00	41 (8.8)a	22 (12.8)a	>0.05
Consultation response time, min	44.4	60.3	0.52***
Hospitalization, n(%)	6 (1.3)	1 (0.6)	0.34*
True Dermatological Emergency,n (%)	37 (7.9)	13 (7.6)	0.86*

Std: Standart Deviation, min: minute, *: T-test, **: Chi-square test, ***: Mann Whitney Utest, b: Each subscript letter denotes a subset of pandemic status categories whose column proportions do not differ significantly from each other at the 0.5 levels.

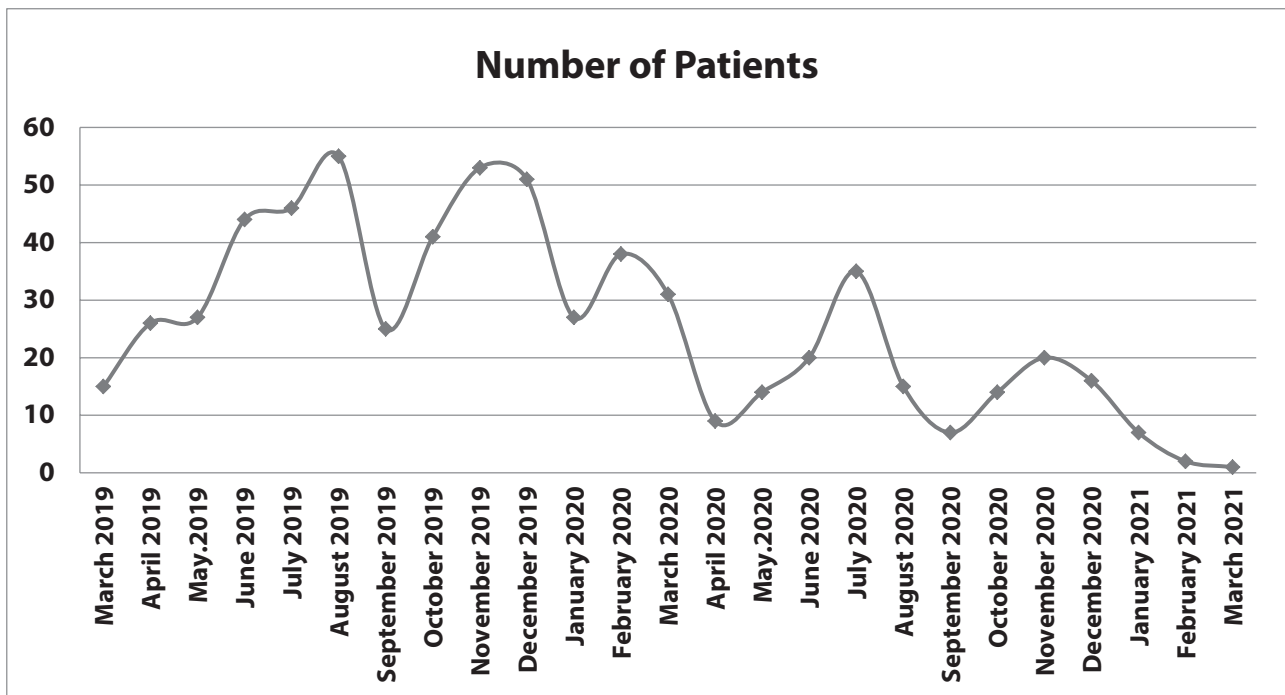


Figure 1. Distribution of the Number of Patients by Month.

Table 2. Comparison of Diseases Profile.

Diseases, n (%)	Pre-Pandemic	Pandemic	P-value*
Dermatitis	73 (15.6)	35 (20.3)	0.3
Irritant contact dermatitis	13 (2.8)	4 (2.3)	0.96
Allergic contact dermatitis	39 (8.4)	8 (4.7)	0.11
Dermatitis, others	21 (4.5)	23 (13.4)	0.01
Infection Diseases	223 (47.7)	84 (48.8)	0.96
Impetigo/folliculitis	28 (6)	3 (1.7)	0.02
Cellulitis	25 (5.4)	13 (7.6)	0.29
Dermatophytosis	12 (2.6)	5 (2.9)	0.81
Herpes Simplex	8 (1.7)	0 (0)	0.08
Herpes Zoster	125 (20.8)	50 (29.1)	0.56
Leishmaniasis	1 (0.2)	1 (0.6)	0.46
Scabies	22 (4.7)	12 (7)	0.25
Syphilis	2 (0.4)	0 (0)	0.39
Hypersensitivity Diseases	115 (24.6)	42 (24.4)	0.9
Urticaria	53 (11.3)	16 (9.3)	0.46
Angioedema	29 (6.2)	13 (7.6)	0.54
Insect Bite	11 (2.4)	7 (4.1)	0.24
Maculopapular Drug Eruption	14 (3)	6 (3.5)	0.5
Erythema Multiforme	8 (1.7)	0 (0)	0.08
Inflammatory Diseases	25 (5.3)	8 (4.6)	0.87
Psoriasis	8 (1.7)	1 (0.6)	0.28
Pityriasis Rosea	10 (2.1)	1 (0.6)	0.17
Cutaneous Vasculitis	5 (1.1)	6 (3.5)	0.03
Behcet Disease	2 (0.4)	0 (0)	0.54
Autoimmune Bullous Disease	8 (1.7)	0 (0)	0.08
Others	23 (4.9)	2 (1.2)	0.32
Leg Ulcer	1 (0.2)	2 (1.2)	0.12
Alopecia Areata	2 (0.4)	0 (0)	0.39
Acne Vulgaris	3 (0.6)	0 (0)	0.29
Pruritus	17 (3.6)	0 (0)	0.01
Total	467 (100)	172 (100)	

*: Chi-squaretest

There were numerous published studies evaluating dermatologic emergency consultations in the pre-pandemic period. The mean age of the patients included in these studies was between 43-51. The rate of male patients was between 47-62% [11-15]. As expected, similar findings were found in the pre-pandemic period of our study.

In pre-pandemic period studies, the most frequently consulted diseases were non-specific dermatitis, scabies, contact dermatitis, herpes zoster, superficial fungal infections, maculopapular drug eruptions, urticaria, erysipelas/cellulitis and cutaneous vasculitis [11-15]. However, the incidence of the aforementioned diseases varied in these studies. Similar diseases were also consulted in the pre-pandemic period of our study.

Bullous disorders with extensive involvement, angioedema, erythroderma, toxic epidermal necrolysis, Steven Johnson's syndrome, pustular psoriasis with metabolic complications were defined as a true dermatological emergency in Gupta et al's study [10]. On the other hand, Murr et al. defined diseases that started or flared up for 5 days as dermatological emergencies [16]. In pre-pandemic period studies, similar to our results, true dermatological emergencies were between 6-24.7% of the consulted diseases [11,12,15]. It was clearly seen that the rate of real dermatological emergencies among the diseases consulted from the emergency department to dermatology was quite low. We thought that this situation was caused by the fact that public and emergency physicians did not know which dermatological disease was a true emergency.

There were few studies investigating the impact of the COVID-19 pandemic on dermatology consultations requested from emergency departments [8,9]. These studies showed that the number and mean age of consulted patients decreased and the rate of male patients increased during the pandemic period [8,9]. However, our study showed that the mean age of the patients during the pandemic period was higher. On the other hand, Demirel Ogut et al. [8] reported that the rate of hospitalizations and true dermatological emergencies decreased during the pandemic period. Similar results were obtained in our study. Emergency department triage systems facilitate the categorization of emergency patients according to their disease severity and determine both treatment priority and treatment location [17]. In our study, while the rate of patients consulted from the yellow zone increased during the pandemic period, the rate of patients consulted from the green zone decreased. This showed that the number of unnecessary consultations decreased during the pandemic period. We thought that these situations were caused by the fear of infection and the curfews.

In this study, consultations requested between 08.00-16.00 increased and the consultations requested between 16.00-00.00 decreased during the pandemic period

compared to the pre-pandemic period. Similar results were obtained by Neslihan Ogut et al. [8]. During the COVID-19 pandemic, countries started to take measures quickly, the most important of which was the curfew. The curfew was imposed on all weekends and weekdays between 21.00-05.00 in our country. We thought that this situation caused a change in consultation hours.

Emergency departments are one of the most crowded places in hospitals that work 7 days and 24 hours. Turkey has the world's highest number of emergency department visits annually: some 100 million. The high number of patients, especially in our country, is one of the risk factors for transmission during the COVID-19 pandemic. In our study, it was found that consultation response time increased during the pandemic period compared to the pre-pandemic period (44.4 minutes vs 60.3 minutes). Both the working of dermatology physicians in the COVID departments and the increase of COVID patient load on emergency departments should have increased the consultation response time. The prolongation of the consultation response time increased the length of stay of the patients in emergency departments and this situation could have increased the non-COVID patient burden on emergency departments.

Along with the pandemic, the distribution of the number of patients by month also changed. Demirel Ogut et al. [8] reported that the number of patients decreased in March 2020, April 2020, and May 2020 compared to 2019, and the number of patients started to increase as of June 2020. A similar trend was obtained in our study. Interestingly, in our study, the number of patients decreased as of July 2020, and the number of patients in 2019 could never be reached. In our country, full or partial curfews were implemented to coincide with the periods when the number of patients decreased. We thought that this result was caused by the curfews and travel bans during the pandemic period

Pandemic period studies showed that the profile of the disease consulted from emergency departments has changed [8,9]. In Isoletta et al.'s study, although urticaria, atopic eczema and acute onset infections were reported to be the most frequently consulted diseases during the pandemic period, urticaria, vasculopathic lesions and scabies were found to be statistically significantly higher compared to the pre-pandemic period [9]. In Demirel Ogut et al's study, although contact dermatitis, scabies and urticaria were reported to be the most frequently consulted diseases during the pandemic period, scabies and pityriasis rosea were found to be statistically significantly higher and herpes zoster was found statistically significantly lower compared to the pre-pandemic period [8]. In addition to obtaining similar results, the rate of pruritus and impetigo/folliculitis was statistically significantly lower in our study. These results showed that non-urgent situations decreased during the pandemic

period. In our study, as in other studies [8, 9], diseases previously associated with COVID-19 disease and vaccines such as herpes zoster, cutaneous vasculitis and urticaria were listed. Emergency department physicians should be careful about these diseases and COVID-19 should be investigated.

Limitations

This study had some limitations. The study was retrospectively planned from a single care center. The diagnoses of the patients were made according to ICD-10 codes. There may have been person-based errors in adding the diagnostic codes to the system. More than one doctor was evaluating the consultations. In this case, there may be conflicts about the accuracy of the diagnoses. However, to correct this situation, the diagnosis is confirmed by a second doctor.

Conclusion

This study showed that the prolongation of the consultation response time increased during the COVID-19 pandemic period. The distribution of the number of patients by month changed, and the number of patients decreased as of July 2020. The profile of dermatological diseases consulted from the emergency department also has changed. During the pandemic period, non-urgent conditions such as impetigo/folliculitis and pruritus decreased. Emergency departments are the busiest and fastest areas of the hospital. Pandemics such as COVID-19 may also occur in the coming years. Informing the public about dermatological emergencies and adding adequate dermatology training to the training of emergency physicians will facilitate appropriate patient management in emergency departments.

References

1. Puspitasari IM, Yusuf L, Sinuraya RK, Abdulah R, Koyama H. Knowledge, Attitude, and Practice During the COVID-19 Pandemic: A Review. *J Multidiscip Healthc.* 2020;13:727-733.
2. Benke C, Autenrieth LK, Asselmann E, Pané-Farré CA. Lockdown, quarantine measures, and social distancing: Associations with depression, anxiety and distress at the beginning of the COVID-19 pandemic among adults from Germany. *Psychiatry Res.* 2020 Nov;293:113462.
3. Kutlu Ö, Güneş R, Coerd K, Metin A, Khachemoune A. The effect of the “stay-at-home” policy on requests for dermatology outpatient clinic visits after the COVID-19 outbreak. *Dermatol Ther.* 2020;33: e13581.
4. Sun Q, McMahon DE, Ugwu-Dike PO, Sun Q, Tang K, Zhang H, Suchonwanit P, et al. How Coronavirus Disease 2019 Changed Dermatology Practice in 1 Year Around the World: Perspectives from 11 Countries. *Dermatol Clin.* 2021;39(4):639-651.
5. Çaytemel C, Erdem O, Ağırgöl Ş, Türkoğlu Z. Dermatology outpatient clinic outcomes after COVID-19 outbreak: What is new normal? *Dermatol Ther.* 2021 May;34(3):e14950.
6. Hartnett KP, Kite-Powell A, DeVies J, et al. Impact of the COVID-19 Pandemic on Emergency Department Visits - United States, January 1, 2019-May 30, 2020. *MMWR Morb Mortal Wkly Rep.* 2020;69(23):699-704.
7. Santi L, Golinelli D, Tampieri A, et al. Non-COVID-19 patients in times of pandemic: Emergency department visits, hospitalizations and cause-specific mortality in Northern Italy. *PLoS One.* 2021;16(3):e0248995.
8. Demirel Ögüt N, Tabak GH, Gülseren D, Yalıcı-Armağan B, Akdoğan N, Doğan S, Elçin G, Karaduman A, Ersoy Evans S. The effect of the COVID-19 pandemic on dermatology consultation requests from adult and paediatric emergency departments. *Int J Clin Pract.* 2021;75(12):e14906.
9. Isoletta E, Vassallo C, Brazzelli V, Giorgini C, Tomasini CF, Sabena A, Perlini S, De Silvestri A, Barruscotti S. Emergency accesses in Dermatology Department during the Covid-19 pandemic in a referral third level center in the north of Italy. *Dermatol Ther.* 2020;33(6):e14027.
10. Gupta S, Sandhu K, Kumar B. Evaluation of emergency dermatological consultations in a tertiary care centre in North India. *J Eur Acad Dermatol Venereol.* 2003;17:303-5.
11. Jack AR, Spence AA, Nichols BJ, et al. Cutaneous conditions leading to dermatology consultations in the emergency department. *West J Emerg Med.* 2011;12(4):551-555.
12. Ozkur E, Altunay I, Sekerlisoy G, Erdem Y. Evaluation of Dermatology Consultations in a Tertiary Care Centre Emergency Service. *Sisli Etfal Hastan Tip Bul.* 2020;54(2):197- 200.
13. Drago F, Gasparini G, Signori A, Campisi C, Cozzani E, Parodi A. Dermatological consultations in an observation unit of an emergency department in Italy. *J Eur Acad Dermatol Venereol.* 2015;29:973-80.
14. Rubegni P, Cevenini G, Lamberti A, Bruni F, Tiezzi R, Verzuri A, Barbini P, Manzi P, Fimiani M. Dermatological conditions presenting at the Emergency Department in Siena University Hospital from 2006 to 2011. *J Eur Acad Dermatol Venereol.* 2015;29(1):16
15. Demirel Ögüt N, Gülseren D, Yalıcı-Armağan B, Akdoğan N, Günaydın SD, Elçin G, Karaduman A, Ersoy-Evans S. Dermatology consultation requests from a university hospital's pediatric and adult emergency departments: A 5-year retrospective analysis. *Am J Emerg Med.* 2022(4);53:112-117.
16. Murr D, Bocquet H, Bachot N, Bagot M, Revuz J, Roujeau JC. Intérêt d'une consultation hospitalière d'urgences dermatologiques [Medical activity in a emergency outpatient department dermatology]. *Ann Dermatol Venereol.* 2003;130:167-70.
17. Weyrich P, Christ M, Celebi N, Riessen R. Triagesysteme in der Notaufnahme [Triage systems in the emergency department]. *Med Klin Intensivmed Notfmed.* 2012;107(1):67- 78. 18. Smith M. Rise in violence against doctors in Turkey, elsewhere. *CMAJ.* 2015;187(9):643. 4- 8.