Journal of Pakistan Association of Dermatologists. 2024;**34(4)**:1009-1016.

Original Article

Seasonal rhythm of dermatoses among adults presenting to a tertiary care hospital

Alina Abbass[1], Hira Tariq[1], Mariam Sheikh[2], Wahid Zaman Khan[3], Hassan Tariq Butt[1], Saelah Batool[1], Faria Asad[1]

[1] Department of Dermatology, Services Institute of Medical Sciences/ Services Hospital, Lahore.
[2] Department of Dermatology, Akhtar Saeed Medical & Dental College, Lahore.
[3] Benazir Bhutto Shaheed Teaching Hospital, Abbottabad.

Abstract

Objective To analyze the effect of seasonal variations in adult dermatoses at a tertiary care hospital in Lahore.

Methods It was an observational study, conducted in Dermatology outdoor of Services Hospital Lahore. All patients of both genders above 15 years of age were included in this study. The pattern of dermatoses was assessed in four seasons i.e. winter, spring, summer and autumn. The data were analyzed using SPSS vs. 20. Role of effect modifiers was analyzed using Chi Square test.

Results Total 6822 adults were managed in OPD. Infections (24.4%) were the commonest group of dermatoses, followed by infestations (17.2%) and eczemas (14.7%). Most of the cases in all categories of dermatoses were seen during summer season (42.1%), especially infections and infestations, followed by autumn (24.43%), spring (17.47%) and winter (16.02%). The difference of patterns among dermatoses was statistically significant (p value 0.00). Scabies was the commonest dermatosis (16.03%) followed by acne (9.08%) and hand eczema (5.98%).

Conclusion Seasons have a significant impact on pattern of adult dermatoses reflecting aetiopathogenic role in causation of these diseases.

Key words
Seasonal rhythm; Adult; Dermatoses; Pakistani population.

Introduction

According to UNICEF report 2021, Pakistan has a population of 212 million and nearly 55 percent of the population is above 18 years of age.[1] The 2017 census of Pakistan showed that 56% of our population is of 15 years and above.[2] Globally skin diseases in adults are very common, affecting 30 to 70% of people throughout the world, as they are an important public health concern.[3,4] Adult dermatoses are frequent reason for consultation in outpatient department of many private as well as government hospitals. Skin diseases in adults are seen by both physicians and dermatologists throughout the world.[5] More than 3000 skin diseases have been identified that affect individuals of all ages and social conditions. They include both acute as well as chronic dermatoses, benign as well as malignant skin cancers. They pose a heavy burden on patients in terms of quality-of-life impairment and costs.[6,7] In spite of the high prevalence of skin diseases in adults and their high disease burden, they have been not been prioritized in the

Manuscript: Received on: March 22, 2024
Revision on: October 08, 2024
Accepted on: October 11, 2024
Address for correspondence
Dr. Hira Tariq, Assistant Professor,
Department of Dermatology,
SIMS/ Services Hospital, Lahore.
Email: kemcolianhira46@gmail.com

development of health policies. But if the skin diseases at outpatient departments have been properly managed, then they can decrease economic burdens of hospital and improve patient's quality of life.[8] A study conducted in 2013 showed that globally skin diseases were the fourth leading cause of disease burden and the 18th leading cause of disability.[9]

Adult skin disorders represent a heterogeneous group of conditions in which some are transient like infections and infestations requiring one or two visits to outpatient department, whereas some dermatoses are chronic like connective tissue diseases, requiring long term follow up visits and some are rare, like genodermatoses. The patterns of skin diseases vary in different parts of the world and even different regions of the same country as it depends on various factors such as climatic conditions, social and hygienic standards, customs, racial constitution, nutritional status as well as genetics. Climate is an important factor in influencing this variation. A study conducted in Iran, from 2019 to 2020, concluded that acne, eczema, warts, seborrheic dermatitis, nevus, vitiligo, lentigo and dermatophytoses presented most during winters, whereas atopic dermatitis was more frequent during the spring and winter. Similarly, actinic keratosis and lichen planus showed peak during summers, however, infections, including viral, bacterial, and fungal diseases, were more frequent during the winter months than summer.[8] Another study in Nepal showed that majority of the visits was in the spring season, followed by summer, winter and autumn. Most common diagnoses were fungal infections, acne and melasma. In majority of the patients fungal infections had peaks in summer (33.7%) and trough in winter (15.3%). The peaks and troughs of other diseases also varied in different seasons.[10]

Learning about the seasonal pattern of skin diseases will help to enlighten us about role of seasons in pathogenesis of these diseases. Moreover, preventive and therapeutic strategies can be made more effective beforehand if we can anticipate an upsurge in particular dermatoses based on seasonal variation especially infectious dermatoses, reducing the risk of complications. As currently no local study is available to describe the seasonal variations in skin disorders in our population, we conducted this study to describe the seasonal variations in adult dermatoses seen at a dermatology outpatient clinic of tertiary care hospital in Pakistan and to compare our data with data around the globe.

Methods

This study was a longitudinal observational study conducted in the Department of Dermatology, Services hospital Lahore. All children above 18 years of age presenting to outpatient department of Dermatology, from 1st July 2022 to 30th June 2023, were included in this study. Each patient underwent complete history taking and complete physical examination, clinical diagnosis was made and where required necessary investigations were carried out.

After informed consent, each patient's demographic and clinical details were recorded on predesigned proforma. The following parameters were studied: age distribution, distribution of dermatoses in groups, frequency of skin diseases, patterns and percentages of different dermatoses according to different age groups. Age was specified in 4 groups; 15-30 years, 31-45 years, 46-60 years, 61 years and above. Another important parameter studied was pattern of adult dermatoses with seasonal variations. Seasons were specified meteorologically as: winter (November to January), spring (February to April), summer

(May to July), autumn (August to October). Majority of the cases were diagnosed clinically. In few cases, where required, labs like fungal scrapping and skin biopsy were performed.

SPSS version 20.0 was used for data entry and analysis. Data was stratified for age, gender and type of skin diseases to see the role of effect modifiers. To check post stratification significance Chi Square test was used. A p-value of ≤0.05 was taken as statistically significant.

Results

A total of 6822 patients were enrolled in this study. **Table 1** shows age and sex distribution. There were 3083 (45%) males and 3739 (55%) females. Most of the patients were in age group of 15-30 years comprising 44% of total patients presented. Patients above the age 61 years constituted 5.4% of total registered cases.

Data regarding frequency and patterns of dermatoses according to seasonal variations were analyzed **(Table 2)**.

Table 1 Age and Gender distribution of patients

Age groups	Gender		Total
	Male	Female	
15- 30 years	1284	1703	2987 (44%)
31-45 years	969	1323	2292(34%)
46-60 years	601	575	1176(17.2%)
61 and above	229	138	367(5.4%)
Total	3083	3739	6822

For simplification of data, dermatoses were broadly classified into 20 groups including infestations (scabies, pediculosis and insect bite reaction), infections (bacterial, viral, fungal, tuberculosis and sexually transmitted skin infections), papulosquamous dermatoses (psoriasis, lichen planus, etc.), connective tissue disease CTD (systemic lupus erythematosus, systemic sclerosis, dermatomyositis, morphea, etc.), eczema (seborrheic dermatitis, allergic contact dermatitis. Hand eczema, etc.) and Immunobullous disorder (pemphigus and pemphigoid group). Others groups include inflammatory dermatosis, pigmentary disorder,

Table 2 Pattern of dermatoses according to seasons

Dermatosis group	*Seasons*				*Total*	
	Winter	*Spring*	*Summer*	*Autumn*	*n*	*(%)*
Papulosquamous Dermatoses	115	111	172	120	518	(7.6%)
CTD (Connective Tissue Disease)	60	41	50	35	186	(2.7%)
Eczema	165	188	402	246	1001	(14.7%)
Immunobullous disorder	67	42	39	39	187	(2.7%)
Inflammatory dermatosis	38	24	121	56	239	(3.5%)
Pigmentory disorder	56	69	214	112	451	(6.6%)
Vascular disorder	10	5	11	17	43	(0.0001%)
Genodermatosis	8	5	11	10	34	(0.0001%)
Acquired hair disorder	32	35	103	51	221	(3.2%)
Nail disorder	0	2	12	2	16	(0.00001%)
Naevi	6	3	10	8	27	(0.000001%)
Sweat and sebaceous gland disorder	125	97	309	205	736	(10.7%)
Infection	212	253	821	381	1667	(24.4%)
Infestations	130	252	474	316	1172	(17.2%)
Sexually transmitted disease	4	4	8	7	23	(0.00001%)
Ulcers	17	11	9	13	50	(0.0001%)
Metabolic disorders	1	3	1	1	6	(0.00000%)
Tumors	3	1	6	2	12	(0.00000%)
Drug reactions	14	10	12	10	46	(0.0001%)
Disease of oral cavity	7	1	7	3	18	(0.00000%)
Miscellaneous	22	34	78	39	169	(2.5%)
Total	1093	1192	2870	1667	6822	(1005)

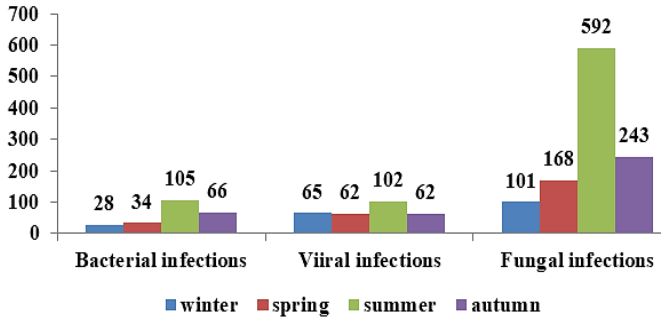

Figure 1 Pattern of infections in different seasons.

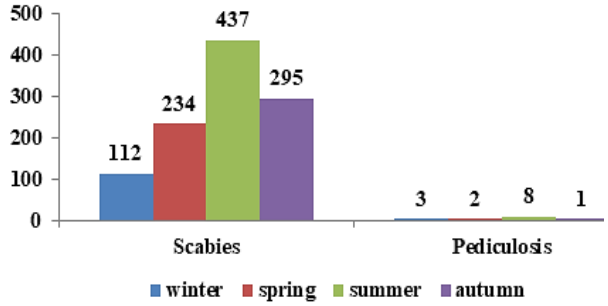

Figure 2 Pattern of infestations in different seasons.

vascular disorder, genodermatoses, Acquired hair disorder, nail disorder, naevi, sweat and sebaceous gland disorder, ulcers, metabolic disorders, tumors, drug reactions, disease of oral cavity, miscellaneous group included less commonly seen dermatoses like keloids, post burn scars, lymphangioma circumscriptum and amyloidosis etc.

Infections (24.4%) were the commonest group of dermatoses seen, followed by infestations (17.2%), eczema (14.7%), sweat and sebaceous gland disorder (10.7%) and papulosquamous Dermatoses (7.6%). Most of the cases in all categories of dermatoses were seen during summer season (42.1%) especially infections and infestations, followed by autumn (24.43%), spring (17.47%) and winter (16.02%). This difference of pattern among dermatoses was statistically significant (p value =0.000).

Among infections, fungal infections (16.2%) were the most common including tinea corporis, tinea cruris, tinea capitis, tinea pedis, tinea mannum, onchymycosis and candial infections etc. Fungal infections were seen most commonly during summers showing that heat and humidity favors fungal growth followed by autumn having 2nd most common cases presentations. Second most common group of infections were bacterial infections (4.5%) consisting of folliculitis, impetigo, ecthyma, erysipelas, cellulitis, etc. Most cases of these infections were presented during summers followed by autumn. Viral infections including warts, chicken pox, herpes were a little more common in summers because change in weather makes children more vulnerable to viral infections. Viral infections also commonly presented to our OPD in winters **(Figure 1)**.

Among infestations, scabies was the commonest dermatosis (16.1%), followed by pediculosis. Scabies was common in summers because of co-sleeping sharing common air conditioner or room cooler, vacations, frequent travelling and visiting **(Figure 2)**.

Third most common group was eczemas, among which hand eczema was seen most commonly (6%) followed by allergic contact dermatitis (4%) and seborrheic eczema. According to our study, hand eczema most frequently presented in summer season, followed by spring and winter **(Figure 3)**. Probably, in summers as children have holidays so household work is increased.

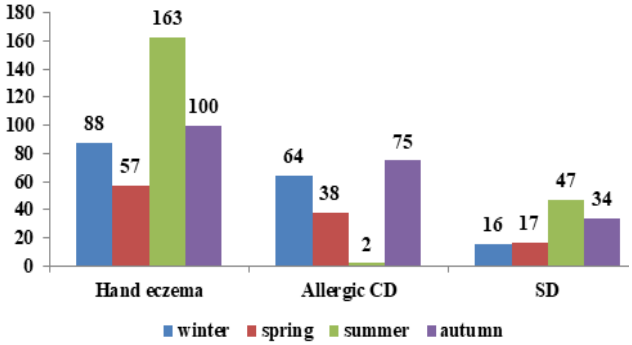

Figure 3 Pattern of eczemas in different seasons.

Those with exacerbations in springs also commonly presented during summer because they get time to visit a hospital in their summer vacations due to their job. Allergic CD frequently presented during autumn followed by winters and spring and least cases in summers. SD most commonly presented during summers followed by autumn.

In sweat and sebaceous group, acne (9%) was most common followed by hidradenitis suppurativa HS followed by miliaria, rosacea and epidermoid cyst were most common. Majority of cases of acne presented during summers followed by autumn whereas hidradenitis suppurative more commonly presented in winters followed by summers and autumn.

Papulosquamous dermatoses include Psoriasis (5%) followed by lichen planus (LP 2.5%). Other dermatoses included in this group include PRP (pityriasis rubra pilaris), lichen nitidus and lichen sriatus. psoriasis was commonly presented in summer season.

Table 3 Frequency of various skin infections.

Different infections	*n*	*%*
Bacterial infections		
Folliculitis	71	1.0
Impetigo	33	0.5
Ecthyma	8	0.1
Erysipelas	3	0.0
Cellulitis	40	0.6
Sycosis barbae	3	0.0
Faruncle	83	1.2
Carbuncle	6	0.1
Abscess	5	0.1
Total	252	4.5
Viral infections		
Chicken pox	20	0.3
Herpes	44	0.6
Varicella Zoster infections	42	0.6
Warts	178	2.6
Viral Exanthemas	4	0.1
Total	288	4.2
Fungal infections		
Tinea Capitis	18	0.3
Tinea corporis	397	5.8
Tinea Faciei	34	0.5
Tinea cruris	205	3.0
Tinea pedis	184	2.7
Tinea manuum	18	0.3
Pityriasis Versicolor	104	1.0
Onchomycosis	82	1.2
Deep fungal	4	0.1
Candidiasis	44	0.6
Paronychia	12	0.2
Tinea Barbarae	3	0.0
Total	1105	16.2
Sexually transmitted infections		
HIV	2	0.0
Syphilis	13	0.0
Non specific genital Ulcer	1	0.0
Total	16	0.0
Cutaneous tubercolosis		
Scrufloderma	3	0.0
LV (Lupus Vulgaris)	3	0.0
Total	6	0.0
Total of all infections	1667	24.4

Discussion

Globally the pattern of skin diseases varies among different countries and even within different regions of the same country. Malnutrition, poor hygiene, overcrowding, and low socio-economic status are important factors contributing to variation of skin diseases in developing countries. Incidence of skin diseases may be affected by various climatic factors such as light, cold, heat, humidity and sunlight. The prevalence of the dermatoses in each region may be affected by the climate either directly or indirectly.[11]

In our study, infections (24.4%) were the commonest, followed by infestations (17.2), eczema (14.7%), sweat and sebaceous gland disorders (10.7%) and papulosquamous dermatoses (7.6%). Fungal infections were most common among infections with high frequency during summers, similarly scabies the commonest manifestation was also most common in summers. Whereas a study in Saudia Arabia in 2010 showed that most common diseases were eczema (19.5%), viral infections (16.6%), pilosebaceous disorders (14.4%),

Table 4 Frequency of various dermatoses.

Different dermatoses	*n*	*%*
Infestations		
Scabies	1094	16.1
Leishmania	10	0.1
Pediculosis	68	1.0
Total	1172	17.2
Eczemas		
Pityriasis alba	3	0.0
Hair dye dermatitis	8	0.1
SD (Seborrheic Dermatitis)	114	1.7
Atopic Dermatitis	43	0.6
CAD (Chronic Actinic Dermatosis)	25	0.4
Photocontact dermatosis	8	0.1
ABCD (Air Born Contact Dermatitis)	3	0.0
Stasis Eczema	41	0.6
Allergic CD (Contact Dermatitis)	178	4.0
Irritant CD (Contact Dermatitis)	85	1.0
LSC (Lichen Simplex Chronicus)	6	0.1
Prurigo nodularis	22	0.3
Hand Eczema	408	6.0
Pompholyx	10	0.1
Xerosis	47	0.7
Total	1001	14.7
Sweat And sebaceous gland disorders		
Hiradinitis suppurativa HS	43	0.6
Acne	620	9.0
Epidermoid cyst	9	0.1
Steocystoma multiplex	4	0.1
Rosacea	14	0.2
Sebaceous Cyst	13	0.2
Miliaria	31	0.5
Syringomas	2	0.0
Total	736	10.7
Papulosquamous Dermatoses		
Psoriasis	336	5.0
LP (Lichen Planus)	169	2.5
PRP (Pityriasis Rubra pilaris)	8	0.1
Lichen Nitidus	3	0.0
Lichen Striatus	2	0.0
Total	518	7.6

pigmentary lesions (11.2%) and hair disorders (7.6%). Viral skin infections (20.0%) was commonly found in males, while eczema (20.7%) constituted the most prevalent skin disease in females. Pigmentary disorders and papulosquamous disorders were more frequent in winter and spring as compared to summer and autumn. Similarly, protozoal infections were recorded high in summer and autumn as compared to winter and spring.[12]

A study in Poland[13] in 2022 showed that scabies was frequently seen in winter, in contrary to our study in which scabies was mostly presented to us in summers. Similarly, eczema in Polish population was more commonly seen in winter as compared to our population in which exacerbation occurred in summers. All these findings may be due to ethnic and climate differentiation. Whereas high percentage of patients of acne presented in summers in both populations.

We found that most of the dermatoses presented in our OPD were seen during summer season (42.1%) followed by autumn, spring and winter. On the contrary, a study in Nepal showed that most of patients visited were in the spring season, followed by summer, winter and autumn. Their study also depicted that their three most common dermatoses were fungal infections, acne and melasma, whereas scabies was our commonest dermatosis followed by acne and hand eczema. This difference was probably due to ethnic and cultural differences between the two populations.[10]

Another study similar to our study showed that in Pakistan in 2020,[14] showed highest percentage of participants were seen in age of 16-30 years (49%). Acne was the most frequent disease (23.3%). Most common skin disease in men was fungal infections (21.2%) whereas in females was acne (24.5%). However, our most common disease was scabies (16%) followed by acne (9.08%).

Our study showed that the most common disease was scabies (28.52%) seen in our population. It was more prevalent in summers because in summer vacations, there is more travelling and get-togethers as well as overcrowding in rooms because of common room coolers and air conditioners. However, a study in Peshawar found that the prevalence of scabies escalated over the study period i.e. 3.8% in 2012 to 4.23%

in 2014. The greatest frequency of scabies (28%) was observed in winter. The reason for this observation was prolonged stay indoors due to harsh weather conditions which increased the chances of person-to-person transmission.[15] Another study from Pakistan showed scabies to be more prevalent during winters.[16]

Among infections, fungal infections were the most common in population, followed by viral and bacterial infections. Most cases of fungal infections presented in summer season. But a study in Iran in 2021, showed that all infections including fungal, viral and bacterial were more common in winters as compared to summers.[8] Another study showed similar results to ours that fungal infections in geriatric population also increased in summer season.[17] Similarly, a study in Brazil showed that majority of cases of bacterial infections presented in summer time.[18]

Among eczemas, hand eczema was most common dermatoses (6%) followed by allergic contact dermatitis and seborrheic dermatitis presenting to our OPD. Most of the patients of allergic contact dermatitis presented in autumn and winters. Several studies showed that seborrheic dermatitis was more common in winter, which is contrary to our study results which showed that most patients of seborrheic dermatitis presented to us in summers.[19,20]

Several studies showed that cases of acne vulgaris increased in summer similar to our findings.[21-23]

Limitations The limitation of this study was that it was carried out for one-year at a single centre, further studies should be done over longer period so that more data would be available. Moreover, multicentric studies should be done.

Conclusions

Diseases of skin have been found to follow a definite pattern in various seasons as, for example, infestations and infections are significantly increased in summer months. Seasons have significant impact on patterns of pediatric dermatoses reflecting their underlying aetiopathogenic role in causation of these diseases. Prevention and therapeutic strategies in combating seasonal effects on these disorders may help in prevention and alleviating these disorders. However more prospective studies are needed to have better understanding of seasonal variations in pediatric as well as adult population in different regions of Pakistan.

Declaration of patient consent The authors certify that they have obtained all appropriate patient consent.

Financial support and sponsorship None.

Conflict of interest The authors affirm that they have no conflicts of interest to disclose.

Author's contribution

AA, HT, MS: Substantial contribution to study design, acquisition of data, manuscript writing, has given final approval of the version to be published.

WZK, HTB, SB, FA: Substantial contribution to analysis and interpretation of data, critical review, has given final approval of the version to be published.

References

1. Annual Report 2020, An in-depth overview of UNICEF Pakistan's activities in 2020. 28 Apr 2021. p 1. https://pakistan.un.org/sites/default/files/2021-04/UN_ResultsReport_2020_Pakistan.pdf
2. Pakistan Bureau of Statistics. 2021. Archived (PDF) from the original on 24 December. 2021. https://www.pbs.gov.pk/publication/monthly-bulletin-statistics-march-2022
3. Wolkenstein P, Grob JJ, Bastuji-Garin S *et al*. French people and skin diseases: results of a survey using a representative sample. *Arch Dermatol*. 2003;**139**:1614-9.

4. Bickers DR, Lim HW, Margolis D *et al*. The burden of skin diseases: 2004: a joint project of the American Academy of Dermatology Association and the Society for Investigative Dermatology. *J Am Acad Dermatol*. 2006; **55**:490-500.
5. Schofield JK, Fleming D, Grindlay D, Williams H. Skin conditions are the commonest new reason people present to general practitioners in England and Wales. *Br J Dermatol*. 2011;165:1044-50.
6. Basra MKA, Shahrukh M. Burden of skin diseases. *Expert Rev Pharmacoecon Outcomes Res* 2009;**9**:271-83.
7. Dalgard FJ, Gieler U, Tomas-Aragones L *et al*. The psychological burden of skin diseases: a cross-sectional multicenter study among dermatological out-patients in 13 European Countries. *J Invest Dermatol*. 2015;**135**:984-91.
8. Khodaei B, Seyedpour S, Gholami B, Garmarudi G, Nasimi M. Seasonal and gender variation in skin disease: A cross-sectional study of 3120 patients at Razi hospital. *Int J Dermatol*. 2021;**7(5Part B)**:799-802.
9. Karimkhani C, Dellavalle RP, Coffeng LE, Flohr C, Hay RJ, Langan SM, *et al*. Global skin disease morbidity and mortality: An update from the global burden of disease study. *JAMA Dermatol*. 2017;**153(5)**:406-12
10. Jha AK, Gurung D. Seasonal variation of skin diseases in Nepal: a hospital based annual study of out-patient visits. *Nepal Med Coll J*. 2006;**8(4)**:266-8.
11. Sardana K, Mahajan S, Sarkar R, Mendiratta V, Bhushan P, Koranne RV *et al*. The Spectrum of Skin Diseases Among Indian Children. *Pediatr Dermatol*. 2009;**26**:6-13.
12. Hani A. The pattern of skin diseases in the Qassim region of Saudi Arabia: What the primary care physician should know. *Ann Saudi Med*. 2010;**30(6)**:448-53.
13. Klimiuk, K.B.; Krefta, D.; Kołkowski, K.; Flisikowski, K.; Sokołowska-Wojdyło, M.; Balwicki, Ł. Seasonal Patterns and Trends in Dermatoses in Poland. *Int J Environ Res Public Health.* 2022;**19**:8934.
14. Sheroze MW, Zaidi SAH, Mehmood B, Khan E, Ali SA, Mazher S. et. al. Frequency of skin diseases and associated factors in a tertiary care hospital in Karachi. *J Pak Assoc Dermatol*. 2020;**30(3)**:456-60.
15. Alam S, Khan H, Orakzai SA, Ahmad R, Mohibullah, Naveed MM. Frequency of scabies with relation to season in patients attending the outdoor patient department of a tertiary care hospital. *Adv Basic Med Sci*. 2020;**4(2)**:87-90.
16. Khalid A, Mehmood T. Spectrum of Pediatric dermatoses and seasonal variation. J Islamic Intern Med Col. 2013; 8; 3:78-82.
17. Yaldiz, M. Dermatological Diseases in the Geriatric Age Group: Retrospective Analysis of 7092 Patients. *Geriatr Gerontol Int*. 2019;**19**:582-5.
18. Brito L.D.A.R, do Nascimento A.C.M, De Marque C, Miot, H.A. Seasonality of the Hospitalizations at a Dermatologic Ward (2007-2017). *An Bras Dermatol*. 2018;**93**:755-8.
19. Weiss SC, Rowell R, Krochmal L. Impact of Seasonality on Conducting Clinical Studies in Dermatology. *Clin Dermatol*. 2008;**26**:565-9.
20. Harvell J.D, Selig D.J. Seasonal Variations in Dermatologic and Dermatopathologic Diagnoses: A Retrospective 15-Year Analysis of Dermatopathologic Data. *Int J Dermatol*. 2016;**55**:1115-8.
21. Park, K.Y.; Jeong, G.J.; Seo, S.J.; Kim, M.N.; Rho, N.K. Seasonality of Acne Severity in Korean Patients: Data from a Dermatologic Clinic and Military Hospital. *J Eur Acad Dermatol* Venereol. 2019;**33**:480-2.
22. Narang, I.; Sardana, K.; Bajpai, R.; Garg, V.K. Seasonal Aggravation of Acne in Summers and the Effect of Temperature and Humidity in a Study in a Tropical Setting. *J Cosmet Dermatol*. 2019;**18:**1098-104.
23. Pappas A, Kendall A.C, Brownbridge L.C, Batchvarova N, Nicolaou A. Seasonal Changes in Epidermal Ceramides Are Linked to Impaired Barrier Function in Acne Patients. *Exp Dermatol*. 2018;**27**:833-6.