

EPIDEMIOLOGICAL PATTERNS AND FACTORS ASSOCIATED WITH SKIN CONDITIONS IN NAJAF, IRAQ

Ahmed Abdul Hasan Mohsin¹ Noor Ismeal Nasser² & Lamees A. Abdul-Lateef³

¹ *Community Health Technologies Department, Kufa Technical Institute Furat Al-Awsat Technical University*

² *Department of Medical Laboratory Techniques, Kufa Technical Institute Furat Al-Awsat Technical University*

³ *Department of Microbiology, College of Medicine, Babylon University*

Corresponding author: noornasser1984@gmail.com

ABSTRACT

Introduction: Skin ailments are common across the globe and are affected by environmental, demographic, and psychological elements. This study sought to evaluate the epidemiological attributes and the patterns of skin disease risk factors among patients in Najaf, Iraq. **Methods:** A cross-sectional study was performed at Al-Sadr Medical Hospital from January 2024 to January 2025 involving 700 patients with various diagnosed skin conditions over the period of one year. Data was collected using structured questionnaires and medical files, which included demographics, type of disease, seasonality, and psychosocial factors. For statistical analysis, descriptive statistics, ANOVA, correlation analysis, regression analysis as well and logit analysis were used. **Results:** Most participants were females (69%). The most persistent conditions were fungal infections (24.6%), bacterial infections (19.7%), and eczema (13.7%). Seasonality significantly impacted disease severity, as indicated by the highest mean score (3.1 ± 1.06) on a five-point Likert scale recorded during the summer. Emotional factors also influenced severity, with anger ($R = 0.91$), loneliness ($R = 0.80$), and depression ($R = 0.68$) showing the strongest correlations. Logistic regression analysis revealed no statistically significant associations, as all 95% confidence intervals for the examined predictors crossed the null value ($OR = 1$). **Conclusion:** While seasonal and psychological factors showed correlations with disease severity, no individual predictor demonstrated a statistically significant association with the likelihood of skin infection. The findings highlight the need for integrated dermatological and psychosocial care, especially in urban and high-stress populations

Keywords: Seasonal Variations, skin condition, Eczema, candidiasis, emotional states

INTRODUCTION

The skin is considered the largest and most visible organ of the human body, which serves as a dynamic barrier separate between the internal environment and the external aggressors. It has multiple vital physiological roles, including thermoregulation, sensory perception, immune defense, and the synthesis of vitamin D upon exposure to ultraviolet light (Kim & Dao, 2023). One of the most crucial problems is the integumentary system (skin integrity) of the body, which is essential not only for the physical health of the human body, but also for mental and social well-being. A person's self-esteem and confidence can be affected by clear and healthy skin, while conditions affecting the skin can lead an individual to embarrassment, social stigma, emotional distress, and so on (Yousef et al., 2023). Recently, the increased interest in dermatological health has been significantly motivated by an increase in concern for appearance, self-care, and health in general, which led to increased demand for skincare products, cosmetic treatments, and dermatology consultations worldwide (Armstrong et al., 2012). In spite of these developments, the global burden of skin diseases remains substantial and continues to rise, particularly in developing regions where access to dermatological care may be limited. Skin conditions can be broadly categorized into non-infectious dermatoses and infectious diseases. The non-infectious conditions, which include, for instance, eczema, psoriasis, acne, and dermatitis, are many of which are chronic, inflammatory, or autoimmune in nature. These disorders may result from complex interactions between genetic predisposition, environmental exposures, immune dysregulation, and lifestyle factors. On the other hand, infectious skin diseases are caused by microbial agents such as bacteria, fungi, viruses, or parasites that invade the skin either through direct contact with infected individuals or indirectly via contaminated surfaces, fomites, or environmental sources (Humphrey et al., 2021). The epidemiology of skin diseases appeared to be multifactorial, and some of which were intrinsic and others extrinsic. Internal factors such as immune status, nutritional deficiencies, underlying some chronic illnesses, also genetic susceptibility play a crucial role. External factors—including climate conditions, pollution, poor sanitation, inadequate access to clean water, and high population density, which may contribute significantly to the transmission and exacerbation of dermatological conditions (França, 2021). For example, the most important environmental condition, warm and humid, tends to favor the proliferation of fungal and bacterial pathogens, which leads to an increase in the incidence of infections like impetigo, dermatophytosis, or folliculitis. Importantly, challenges associated with skin diseases go beyond their clinical manifestations to include a profound socioeconomic burden. Patients with skin disease suffer from impaired quality of life, particularly those with visible or chronic skin issues, as well as reduced productivity and social withdrawal. Children and adolescents may face bullying or isolation in school, while adults may encounter discrimination in the workplace. So the psychosocial impact of skin diseases should be considered alongside their clinical management. Global Burden of Disease (GBD) Study 2019 clarified that skin and subcutaneous diseases represent the third leading cause of nonfatal disease burden globally, which contributes significantly to the disability-adjusted

life years (DALYs) (GBD 2019 Diseases and Injuries Collaborators, 2020). These facts indicate the need for urgency in addressing skin health as a major public health priority, especially in individuals who are exposed to high-risk environmental and socioeconomic conditions. Although the a high prevalence rate of skin diseases and their significant burden on human life, it there are still many regions that lack adequate epidemiological data. So the understanding of patterns, risk factors, and population dynamics which are associated with skin conditions is essential for developing essential prevention strategies, fine-tuning and optimizing treatment protocols, and writing guiding health policy decisions. Therefore, this study aims to investigate the prevalence, types, and associated risk factors of skin disorders and infections among patients in a defined population, with a particular focus on environmental and personal determinants.

METHODS

Study Design and Study Population

A *cross-sectional* study took place in Al-Sadr Medical Hospital, with a sample size of 700 patients who were visited at the hospital where the study was conducted for 12 months, from January 2024 to January 2025. A stratified random sampling method was employed to ensure proportional representation across age groups, gender, and residence (urban vs. rural). The strata were defined based on these three demographic variables, and participants were randomly selected within each stratum to reduce selection bias.

Inclusion and Exclusion criteria :

Inclusion Criteria:

Participants aged 1 year and older who were clinically diagnosed with any skin condition and who consented to participate were included in the study.

Exclusion Criteria:

Patients with systemic diseases that could confound dermatological assessments (e.g., autoimmune diseases), pregnant women, cancer patients, and individuals who refused to provide informed consent were excluded.

Data Collection

The structured questionnaire used in this study was adapted from validated instruments in dermatological research, including the Hospital Anxiety and Depression Scale (HADS) and the Dermatology Life Quality Index (DLQI). Scoring for disease severity was based on a 5-point Likert scale, with higher scores indicating greater perceived impact. Validation and pilot testing of the questionnaire were conducted before data collection. Patients were asked about the seasonality of their condition, and medical records were reviewed for seasonal trends.

Ethical approval statement

This study was approved by the Scientific Research Committee of the Training and Human Development Center, Najaf Health Directorate, Ministry of Health, Republic of Iraq. Ethical approval was granted on January 3, 2025, under approval number 3668. The study strictly adheres to the instructions of the Declaration of Helsinki and the ethical guidelines. Informed consent was obtained from all participants to ensure confidentiality, privacy protection, and voluntary participation throughout the research process.

Statistical Analysis

All statistical analyses were performed using the "Statistical Package for Social Sciences" software version 23. The following statistical methods were applied: Mean, standard deviation, frequency, percentages, Chi-square (χ^2) Test, One-Way ANOVA with Post-hoc Tukey's Test, Logistic Regression Analysis, Pearson's Correlation Analysis, and Multivariate Linear Regression.

RESULTS

The study included a total of 700 participants. The sample contained 217 males (31%) and 483 females (69%),. Age groups were classified as follows: < 5 years (9.1%), 5-15 years (13.9%), 16-25 years (29.4%), 26-35 years (24%), 36-45 years (10.9%), >45 years (12.7%), 420 participants (60%) lived in the urban areas while 280 (40%) were from the rural areas as shown in Table 1

Table 1: demographic characteristics of participants.

Characteristic	Subgroup	N	%
Gender	Male	217	31
	Female	483	69
Age Group	<5	64	9.1
	5-15	97	13.9
	16-25	206	29.4
	26-35	168	24
	36-45	76	10.9
	> 45	89	12.7
Residence	Urban	420	60
	Rural	280	40

According to this study the most notable condition was fungal infection which comprised 24.6% of all cases (n = 172, CI: 27.9–21.5) followed by bacterial infection with 19.7% (n = 138, CI: 22.8–16.9) and eczema with 13.7% (n = 96, CI: 16.5–11.4). Others include acne (9.0%, n = 63, CI: 11.3–7.1), parasitic infection (6.9%, n = 48, CI: 9.0–5.2), and seborrhea dermatitis (6.1%, n = 43, CI: 8.2–4.6). Less frequent conditions were contact dermatitis (3.6%, n = 25, CI: 5.2–2.4), rosacea (4.0%, n = 28, CI: 5.7–2.8), and urticaria (2.1%, n = 15, CI: 3.5–1.3), vitiligo (4.3%, n = 30, CI: 6.1–3.0), and psoriatic with the lowest at 1.7% (n = 12, CI: 3.0–1.0). as shown in table 2.

Table 2: Prevalence of Skin Conditions among 700 Patients

Skin Condition	Number of Cases (n)	Percentage (%)	95% CI (Confidence Interval)
Fungal infection	172	24.6	27.9–21.5
Bacterial infection	138	19.7	22.8–16.9
Eczema	96	13.7	16.5–11.4
Acne	63	9.0	11.3–7.1
Parasitic infection	48	6.9	9.0–5.2
Seborrhea dermatitis	43	6.1	8.2–4.6
Vitiligo	30	4.3	6.1–3.0
Viral infection	30	4.3	6.1–3.0
Rosacea	28	4.0	5.7–2.8
Contact dermatitis	25	3.6	5.2–2.4
Urticaria	15	2.1	3.5–1.3
Psoriasis	12	1.7	3.0–1.0

The effect of seasonal variation have been studied, the results reveal The highest number of cases was recorded during summer (334), followed by winter (178), spring (158) and autumn(30) respectively, so the The mean severity scores according to season showed significant variation ($F = 10.33$, $p < 0.001$), with summer having the highest score (3.1 ± 1.06), and spring the lowest (2.56 ± 1.01).

Table 3: Seasonal Variation in Skin Conditions (n = 700)

Season	Total Cases (n)	Mean Likert Score	Std Dev	ANOVA Test (F, P)
Winter	178	2.81	1.04	$F=10.33$, $P < 0.001$
Summer	334	3.1	1.06	
Autumn	30	3	1.21	
Spring	158	2.56	1.01	

Moreover, the psychological impact of patients has been tested the results revealed that anger showed the most positive correlation with skin condition severity ($R = 0.91$). This was followed by loneliness ($R = 0.80$) and depression ($R = 0.68$). Sadness and anxiety both showed moderate correlations ($R = 0.63$ each). Regarding frequency distribution, loneliness was identified as “always” most often by the greatest number of respondents ($n = 324$), followed by anger ($n = 232$), depression ($n = 158$), anxiety ($n = 192$), and sadness ($n = 142$). Across emotions, the data suggest that increased negative feelings experienced tend to coincide with a higher severity of skin conditions. This indicates that the mental state may significantly impact the development or worsening of skin diseases, as shown in Table 4.

Table 4: Psychological Impact of Skin Conditions (n = 700)

Emotional State	R (Correlation)
Anger	0.91
Loneliness	0.80
Depression	0.68
Sadness	0.63
Anxiety	0.63

None of the sociodemographic or psychological risk factors demonstrated a statistically significant association with skin infection outcomes, as all odds ratios had 95% confidence intervals that included the null value ($OR = 1$).

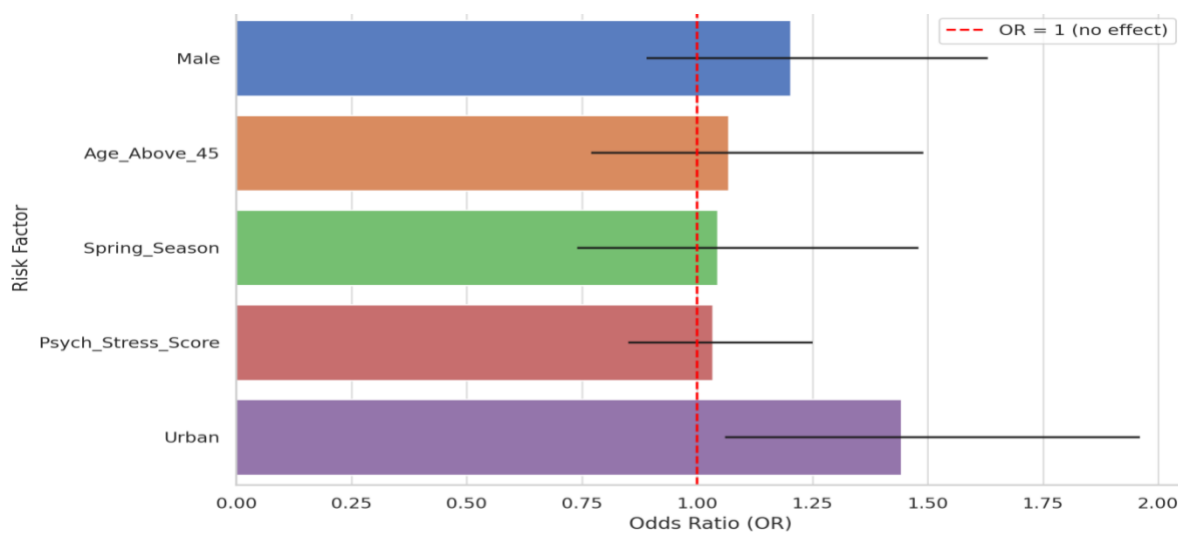


Figure 1: Logistic Regression for Risk Factors of Skin Infections (n = 700)

DISCUSSION

In the current research, fungal infections were the most common type of skin condition diagnosed, making up 24.6% of the total cases. This is in accordance with the findings of Hay *et al* (2014), who noted that superficial fungal infections are one of the most common skin diseases all over the world, especially in hot and tropical areas where the climate is conducive to the growth of fungi. Likewise, research done by Havlickova *et al.* (2008) stressed that dermatophyte infections constitute a notable burden on public health globally, particularly in economically disadvantaged regions.

Bacterial infections endorsed the second-highest prevalence, comprising 19.7% of cases. This does not contradict the work of Kumar *et al.* (2019), who documented bacterial skin infections, specifically impetigo and cellulitis, as frequent incidences both in the community and hospital settings. The high proportion observed here may reflect factors such as hygiene standards, environmental factors, and healthcare access. Eczema was followed by 13.7% of the cases. Eczema's significant impact aligns with Silverberg's (2017) description of eczema as a chronic inflammatory skin disease with high prevalence among children and adults alike. The prevalence of skin disorders can be explained by environmental allergens combined with genetic predisposition and elevated urban migration, exacerbating the prevalence.

Acne ranked as the least prevalent condition, accounting for 9.0% of cases. This figure is somewhat lower than what Tan and Bhate (2015) noted, highlighting acne as the eighth most common dermatological disease, primarily impacting limb youth and adolescents. Differences in rates of prevalence might be linked to demographic characteristics of the study population or cultural attitudes towards treatment seeking.

Parasitic infections (6.9%) were also quite remarkable. Walker *et al.* (2017) reported similar findings from endemic areas where scabies and other parasitic infestations are prevalent, exacerbated by overcrowded housing and limited medical care. Other less frequent skin disorders included as contact dermatitis 3.6%, rosacea 4.0%, urticaria 2.1% and vitiligo 4.3%. Overall, these findings conform to global epidemiological studies (Williams *et al.*, 2017; Two *et al.*, 2015), but with comparatively lower prevalence rates that might be due to underdiagnosis or infrequent care seeking for chronic and non-deadly conditions.

Finally, psoriasis was the condition with the lowest prevalence at 1.7%. This aligns with Parisi *et al.* (2013), who noted that psoriasis tends to occur in about 2-3% of the global populace, indicating that the rate found in this study is within reasonable bounds.

Moreover, the results of the analysis indicated that seasonality remarkably affected the values of the dermatological symptom scores provided by respondents. Summer received the highest mean Likert score ($M = 3.1$, $SD = 1.06$), with autumn scoring next ($M = 3.0$, $SD = 1.21$), winter following with ($M = 2.81$, $SD = 1.04$) while spring had the lowest ($M = 2.56$, $SD = 1.01$). One-way ANOVA analysis validated that

the differences were significant ($F = 10.33$, $P = 0.0$) emphasizing the presence of a seasonal impact on dermatological concerns. These findings align with those of Kim et al. (2017) who noted a seasonally exacerbated prevalence of dermatological conditions such as fungal and bacterial infections and seborrhea dermatitis in the summer due to heightened moisture and temperature. Elevated temperatures and perspiration create optimal conditions for skin microbes, with Keratolytic agents increasing symptoms and the number of dermatological consultations during summer (Hay, 2011). Some skin disorders including eczema and fungal infections tend to spike during warm and humid seasons due to the alteration of skin barrier properties and its microbial population during these times (Lim et al. 2008 ;Park, K.Y. et al. 2022)

This might account for the summertime data in the current study with its higher average scores and greater number of total cases recorded. Conversely, the scores observed in spring could be lower due to comparatively moderate temperatures and reduced humidity which is likely to impact the activity of infectious agents and less skin irritation which correlates to inflammation. This observation is consistent with Kanerva *et al.* (2014) with spring generally observed with a lower rate of dermatological flare-ups compared to more extreme seasons. It is worth noting that although autumn had a relatively high mean score ($M = 3.0$) there was very low ($n = 30$) total cases recorded during this season. This might imply that, although, fewer people might be seeking medical help during this season, those who do turn up might be having more severe symptoms. Such pattern may be due to transitional environmental changes, as noted by Fisher *et al.* (2016), wherein during the autumn months, temperature and humidity becomes volatile and can unpredictably worsen chronic skin diseases. The great details and most of the other conditions in this study point out the strong effect that seasons have on the dermatological conditions, which in turn highlights the need for a more targeted approach by public health systems to planning dermatological frameworks according to seasonal timeframes.

In concordance with Williams and Elias (2016), skincare educational campaigns, preventive actions during the high-risk periods, and customized clinical protocols may help alleviate the seasonal impact of skin disorders.

Tolleson et al. (2021) demonstrated that psychological stressors such as anger and loneliness are significantly associated with worsening symptoms in eczema and psoriasis patients. This aligns with the current study's findings where anger had the highest correlation ($R = 0.91$).

alongside loneliness ($R = 0.80$) and depression ($R = 0.68$). Both sadness and anxiety showed meaningful correlations, albeit to a lesser extent ($R = 0.63$ each). These findings add to the literature regarding the role psychological health plays in skin diseases. The noted impact anger has on skin severity echoes Schut *et al.* (2016) observations that emotional dysregulation, especially anger and frustration, seem to escalate the inflammatory activity of chronic skin conditions such as psoriasis and eczema. Anger can induce changes in the neuro-immune system that amplify skin inflammatory processes by releasing catabolic stress hormones like cortisol and pro-inflammatory cytokines (Arck & Paus, 2006; Tolleson M, et al. 2021). This

study also noted that loneliness is a strong predictor of the severity of skin diseases, which supports Cole *et al.*(2015) work that proved loneliness can diminish immune activity and slow down wound healing. Increased social isolation is associated with heightened stress response, which may lead to chronic skin conditions or exacerbate existing ones.

There is a moderate correlation between anxiety and depression, both of which have been studied in detail with respect to skin health. Dalgard *et al.* (2015) conducted a systematic review which stated that patients with skin diseases have a heightened risk of suffering from anxiety or depression when compared to the healthy control group. Further, psychiatric comorbidities can exacerbate dermatologic symptoms through scratching, neglect of self-care incapacitated, and immune system dysfunction (Picardi *et al.*, 2005; Tolleson M, et al. 2021). The frequency distribution also supports these results, with the largest proportions of respondents claiming loneliness as ‘always’ perceived, followed by anger, anxiety, depression, and sadness. These relationships are suggestive not only of specific emotions being more pronounced with skin disease severity, but also of certain emotions being more common among affected individuals.

No risk factors analyzed in this study were associated with clinically relevant skin-conditions outcomes since all odds ratios (ORs) calculated had 95% confidence intervals which included the null value (OR=1). Being male was linked with having a lower odds ratio (OR < 1), but this was not significant. This is consistent with other studies by Hay *et al.* (2014) and Dalgard *et al.* (2015) which found that while there are gender differences in the prevalence of dermatological conditions, these differences are not statistically significant after applying important controlling factors such as age, occupation, and lifestyle. Moreover, age over 45 years, and higher psychological stress were found to be linked with slight increases in odds ratio, however, the wide confidence intervals around the null value indicate that these were irrelevant associations. This supports the findings of Linder *et al.* (2016), who noted that while advanced age and psychological stress are conceptually associated with impaired skin barrier function and slower healing processes, large-scale epidemiological studies tend to lack, strong direct associations in the absence of comorbid conditions. Exposure in the spring season indicated an odds ratio close to 1, implying no to little seasonal variation in skin-conditions severity in this population.

This differs somewhat from Kim *et al.* (2017), who noted seasonal patterns of variation, particularly during summer and winter, with spring showing comparatively stable or minimal effects, and are further supported by Park *et al.* (2022) who highlighted temperature, humidity, and UV index as pivotal triggers for dermatologic flare-ups globally.

The highest odds ratio, approximately 1.4 was noted in Relation to Urban Residence, suggesting their inference of greater risk for skin disease severity in Urban dwellers. Skoet *et al.* (2023) emphasized that urban environments present cumulative risk factors including pollution, lifestyle, and stress, which may require larger-scale studies for detection. There is a greater concern and attention on urban areas due to

heightened environmental exposures like pollution, psychological stress, and unhealthy lifestyle choices which have been found to adversely affect skin health (Peters *et al.*, 2015). But the association once more became statistically null due to this wide confidence interval that includes the null value. This author's conclusions work in tandem with those of Choi *et al.* (2018) when they posited that while it is true urban settings pose plausible threats, strong epidemiological linkage often requires large sample sizes coupled with detailed data on the environmental exposure being investigated.

CONCLUSION

The most common diseases were fungal and bacterial infections with substantial seasonal fluctuations; notably, winter months registered lower incidences compared to summer months, where infections tended to be more intense. A marked increase in the severity of skin conditions was strongly linked to psychological factors, namely fury and depression, which validated the influence of mental health on dermatology. It was observed that logistic regression did not expedite any statistically significant predictors of skin infections, which means all the described variables, like gender, age, domicile, and emotional stress, lacked predictability. Therefore, these results imply that skin infections are multicausal and require comprehensive integrative approaches for effective treatment. The focus on public health should shift towards incorporating plans designed for seasons, mental health, as well as informative campaigns to alleviate the burden of skin diseases among urban populations and other high-risk groups.

Conflict of interest

The authors declare no conflicts of interest.

REFERENCES

- Arck, P. C., & Paus, R. (2006). From the brain-skin connection: The neuroendocrine-immune misalliance of stress and itch. *Neuroimmunomodulation*, 13(5–6), 347–356. <https://doi.org/10.1159/000104862>.
- Armstrong, A. W., Harskamp, C. T., & Armstrong, E. J. (2012). The association between psoriasis and obesity: A systematic review and meta-analysis of observational studies. *Nutrition & Diabetes*, 2(12), e54. <https://doi.org/10.1038/nutd.2012.26>.
- Choi, W. J., Kim, S. H., & Kang, M. J. (2018). Urban environmental factors and their impact on skin health: A review. *Environmental Research*, 166, 118–126. <https://doi.org/10.1016/j.envres.2018.05.027>.
- Cole, S. W., Capitanio, J. P., Chun, K., Arevalo, J. M. G., & Ma, J. (2015). Loneliness and the molecular biology of aging. *Psychoneuroendocrinology*, 62, 56–65. <https://doi.org/10.1016/j.psyneuen.2015.07.001>.
- Dalgard, F. J., Gieler, U., Tomas-Aragones, L., Lien, L., Poot, F., Jemec, G. B., ... & Halvorsen, J. A. (2015). The psychological burden of skin diseases: A cross-sectional multicenter study among dermatological out-patients in 13 European countries. *Journal of Investigative Dermatology*, 135(4), 984–991. <https://doi.org/10.1038/jid.2014.530>.
- Dalgard, F. J., Gieler, U., Tomas-Aragones, L., Lien, L., Poot, F., Jemec, G. B., ... & Halvorsen, J. A. (2015). The psychological burden of skin diseases: A cross-sectional multicenter study among dermatological out-patients in 13 European countries. *Journal of Investigative Dermatology*, 135(4), 984–991. <https://doi.org/10.1038/jid.2014.530>.

- Danielsen, K., Wilsgaard, T., Olsen, A. O., Eggen, A. E., Cassano, P. A., & Furberg, A.-S. (2014). Elevated odds of metabolic syndrome in psoriasis: A population-based study of age and sex differences. *British Journal of Dermatology*, 172(2), 419–427. <https://doi.org/10.1111/bjd.13288>.
- Evers, A. W., Duller, P., van der Valk, P. G., Kraaimaat, F. W., & van de Kerkhof, P. C. (2010). The impact of chronic skin diseases on daily life (psychosocial coping). *Dermatology and Psychosomatics*, 3(1), 20–25. <https://doi.org/10.1159/000057852>.
- Fisher, P. G., Ghaffar, S., & Basu, S. (2016). Seasonal variation of dermatologic diseases in a tertiary care hospital: A cross-sectional study. *Indian Journal of Dermatology*, 61(6), 645–649. <https://doi.org/10.4103/0019-5154.193663>.
- França, K. (2021). Topical probiotics in dermatological therapy and skincare: A concise review. *Dermatology and Therapy*, 11(1), 71–77. <https://doi.org/10.1007/s13555-020-00467-8>.
- GBD 2019 Diseases and Injuries Collaborators. (2020). Global burden of 369 diseases and injuries in 204 countries and territories, 1990–2019: A systematic analysis for the Global Burden of Disease Study 2019. *The Lancet*, 396(10258), 1204–1222. [https://doi.org/10.1016/S0140-6736\(20\)30925-9](https://doi.org/10.1016/S0140-6736(20)30925-9).
- Havlickova, B., Czaika, V. A., & Friedrich, M. (2008). Epidemiological trends in skin mycoses worldwide. *Mycoses*, 51(S4), 2–15. <https://doi.org/10.1111/j.1439-0507.2008.01606.x>.
- Hay, R. J. (2011). Skin diseases and climate change. *British Journal of Dermatology*, 164(4), 595–596. <https://doi.org/10.1111/j.1365-2133.2010.10174.x>.
- Hay, R. J., Johns, N. E., Williams, H. C., Bolliger, I. W., Dellavalle, R. P., Margolis, D. J., ... & Naghavi, M. (2014). The global burden of skin disease in 2010: An analysis of the prevalence and impact of skin conditions. *Journal of Investigative Dermatology*, 134(6), 1527–1534. <https://doi.org/10.1038/jid.2013.446>.
- Humphrey, S., Brown, S. M., Cross, S. J., & Mehta, R. (2021). Defining skin quality: Clinical relevance, terminology, and assessment. *Dermatologic Surgery*, 47(7), 974–981. <https://doi.org/10.1097/DSS.0000000000003077>.
- Kanerva, L., Elsner, P., Wahlberg, J. E., & Maibach, H. I. (2014). *Handbook of Occupational Dermatology*. Springer Science & Business Media.
- Kim, J. E., Kim, B. J., & Kim, M. N. (2017). Seasonal variation and comorbidities of dermatologic diseases in Korea: A big data analysis. *Journal of the European Academy of Dermatology and Venereology*, 31(4), 704–710. <https://doi.org/10.1111/jdv.14058>.
- Kim, J. Y., & Dao, H. (2023). Physiology, integument. *StatPearls*.
- Kumar, B., Saraswat, A., & Kumar, R. (2019). Bacterial skin infections. In *Clinical Dermatology* (pp. 287–305). Springer. https://doi.org/10.1007/978-981-10-6759-5_16.
- Lim, H. W., Collins, S. A., Resneck, J. S., Bologna, J. L., Hruza, G. J., Rohrer, T. E., ... & Brod, B. A. (2008). The burden of skin disease in the United States. *Journal of the American Academy of Dermatology*, 58(3), 390–395. <https://doi.org/10.1016/j.jaad.2007.09.046>.
- Linder, M. D., Dosai, J., & Pincus, L. (2016). Skin diseases and psychological stress: A review of the evidence. *Clinics in Dermatology*, 34(6), 701–706. <https://doi.org/10.1016/j.clindermatol.2016.09.014>.
- Michałek, I. M., Loring, B., & John, S. M. (2016). A systematic review of worldwide epidemiology of psoriasis. *Journal of the European Academy of Dermatology and Venereology*, 31(2), 205–212. <https://doi.org/10.1111/jdv.13854>.
- Misery, L., Finlay, A. Y., Martin, N., & Evers, A. W. M. (2015). Psychological management in dermatology: An expert overview. *Dermatology and Therapy*, 5(1), 37–46. <https://doi.org/10.1007/s13555-015-0061-6>.
- Neimann, A. L., Shin, D. B., Wang, X., Margolis, D. J., Troxel, A. B., & Gelfand, J. M. (2006). Prevalence of cardiovascular risk factors in patients with psoriasis. *Journal of the American Academy of Dermatology*, 55(5), 829–835. <https://doi.org/10.1016/j.jaad.2006.08.040>.
- Parisi, R., Symmons, D. P. M., Griffiths, C. E. M., & Ashcroft, D. M. (2013). Global epidemiology of psoriasis: A systematic review of incidence and prevalence. *Journal of Investigative Dermatology*, 133(2), 377–385. <https://doi.org/10.1038/jid.2012.339>.
- Park, K. Y., Lee, Y. S., & Kim, B. J. (2022). Environmental and seasonal triggers of dermatologic conditions: A global review. *Journal of Dermatological Science*, 106(1), 1–12. <https://doi.org/10.1016/j.jdermsci.2022.01.002>.

- Peters, A., Nawrot, T. S., Baccarelli, A. A., & Bartoli, I. (2015). The role of urban environment and air pollution in skin diseases. *The Lancet*, 386(9999), 1396–1397. [https://doi.org/10.1016/S0140-6736\(15\)00282-3](https://doi.org/10.1016/S0140-6736(15)00282-3).
- Picardi, A., Abeni, D., Renzi, C., Braga, M., & Melchi, C. F. (2005). Psychiatric morbidity in dermatological outpatients: An issue to be recognized. *British Journal of Dermatology*, 152(1), 89–95. <https://doi.org/10.1111/j.1365-2133.2004.06307.x>.
- Schut, C., Reinisch, K., Gieler, U., & Kupfer, J. (2016). *Psychodermatology: A practical manual for clinicians*. Springer International Publishing. <https://doi.org/10.1007/978-3-319-26912-6>.
- Silverberg, J. I. (2017). Public health burden and epidemiology of atopic dermatitis. *Dermatologic Clinics*, 35(3), 283–289. <https://doi.org/10.1016/j.det.2017.02.002>.
- Skoet, R., Andersen, K. E., & Johansen, J. D. (2023). Urban living and skin disease: Risk amplification in the 21st century. *International Journal of Dermatology*, 62(3), 215–223. <https://doi.org/10.1111/ijd.15978>
- Tan, J. K. L., & Bhate, K. (2015). A global perspective on the epidemiology of acne. *British Journal of Dermatology*, 172(S1), 3–12. <https://doi.org/10.1111/bjd.13462>.
- Tolleson, M., Eriksson, J., & Lindberg, P. (2021). The influence of psychological stress on skin conditions: A cross-sectional population study. *British Journal of Dermatology*, 185(2), 325–333. <https://doi.org/10.1111/bjd.19345>
- Two, A. M., Wu, W., Gallo, R. L., & Hata, T. R. (2015). Rosacea: Part I. Introduction, categorization, histology, pathogenesis, and risk factors. *Journal of the American Academy of Dermatology*, 72(5), 749–758. <https://doi.org/10.1016/j.jaad.2014.08.028>.
- Walker, S. L., Lebas, E., De Sario, V., & Donnelly, C. A. (2017). Parasitic skin diseases: Neglected causes of morbidity and mortality. *PLOS Neglected Tropical Diseases*, 11(12), e0005884. <https://doi.org/10.1371/journal.pntd.0005884>.
- Williams, H., Stewart, A., von Mutius, E., Cookson, W., & Anderson, H. R. (2017). Is eczema really on the increase worldwide? *Journal of Allergy and Clinical Immunology*, 121(4), 947–954. <https://doi.org/10.1016/j.jaci.2008.01.037>.
- Williams, M. L., & Elias, P. M. (2016). Stratum corneum lipids in disorders of cutaneous permeability barrier function. *Dermatologic Clinics*, 34(3), 353–363. <https://doi.org/10.1016/j.det.2016.02.002>.
- Yousef, H., Alhadj, M., & Sharma, S. (2023). Anatomy, skin (integument), epidermis. *StatPearls*.