Demographic and Environmental Factors Associated with Skin Disorders

Md. Ashraful Haque[1*], Md Nazim Uddin[2], Sadia Sarwar[3], Sazib Miah[4]

[*1]Assistant Professor & Head, Department of Skin & VD, Central Medical College & Hospital, Cumilla, Bangladesh.
Email: ashraful.haque555@gmail.com
Orcid Id: 0009-0007-1196-9019

[2]Assistant Professor, Department of Medicine, Central Medical College, Cumilla, Bangladesh.
Email: nahianchowdhury2013@gmail.com
Orcid Id: 0000-0001-6586-5636

[3]Student, Global Cultural Industries Management, Calvin University, South Korea.
Email: sadiasarwar2000@gmail.com
Orcid Id: 0009-0009-0272-2473

[4]Director, (Training & Development), IOJH Limited, Dhaka, Bangladesh.
Email: saziboxfam@gmail.com
Orcid Id: 0009-0006-4769-198X

*Corresponding Author

Abstract

Background: Skin disorders are prevalent worldwide, influenced by a myriad of demographic and environmental factors. Understanding these associations is crucial for effective prevention and management. This study explores the complex interplay between demographics, environmental exposures, and skin disorders to inform targeted interventions and public health strategies. **Material & Methods:** This observational study employed a cross-sectional design to capture data from a diverse population at Central Medical College & Hospital, Cumilla, Bangladesh, spanning from January 2023 to January 2024, with a total of 109 participants. The primary variables include the type and incidence of skin disorders, demographic information (age, gender, ethnicity), environmental factors (exposure to allergens, pollutants, sunlight), lifestyle factors (diet, hygiene practices), and family history of skin disorders. Data is collected using standardized data collection forms and instruments to ensure consistency and comparability across participants. Data were analyzed by SPSS version 20.0. Descriptive statistics were used in this study. **Results:** The study revealed varying prevalence rates of skin disorders across demographics and environmental factors. Acne vulgaris was more prevalent among females and urban residents, while eczema was notably higher among manual laborers. Psoriasis exhibited significant associations with ethnicity. These findings underscore the complex interplay between demographic factors and environmental influences on skin health. **Conclusions:** The comprehensive analysis of demographic and environmental factors in this study sheds light on the complex dynamics underlying skin disorders. By elucidating these associations, our findings underscore the pivotal role of demographics and environmental influences in shaping the prevalence of skin disorders. This understanding is paramount for crafting tailored interventions and public health strategies aimed at mitigating the burden of these conditions.

INTRODUCTION

Skin disorders are prevalent worldwide, affecting individuals of all ages, genders, and ethnicities. They encompass a broad spectrum of conditions, ranging from common ailments like acne and eczema to more severe diseases such as melanoma and psoriasis. Demographic factors, including age, gender, ethnicity, and socioeconomic status, play fundamental roles in

shaping the epidemiology of skin disorders. Age is a critical determinant, with certain conditions exhibiting distinct age-related patterns. For instance, acne vulgaris commonly affects adolescents due to hormonal changes during puberty, while melanoma incidence increases with age, particularly in older adults with cumulative sun exposure.[1] Gender disparities are also evident in the prevalence and manifestation of various skin disorders. Autoimmune conditions like lupus erythematosus and scleroderma are more prevalent in women, possibly due to hormonal influences and genetic predispositions.[2] Additionally, differences in skin physiology and grooming practices contribute to gender-specific patterns of dermatologic conditions. For example, men are more prone to developing seborrheic dermatitis and alopecia, whereas women are more susceptible to conditions like rosacea and cellulitis.[3] Ethnicity exerts a significant influence on dermatologic health, with certain skin disorders exhibiting notable racial disparities. For instance, keloids are more prevalent in individuals of African, Asian, and Hispanic descent, whereas vitiligo and sarcoidosis disproportionately affect individuals with darker skin tones.[4] These variations can be attributed to genetic predispositions, cultural practices, and differences in skin structure and pigmentation among ethnic groups. Socioeconomic status serves as a crucial determinant of skin health, influencing access to healthcare services, hygiene practices, and environmental exposures. Individuals from lower socioeconomic backgrounds often face barriers to healthcare access, leading to delayed diagnosis and inadequate management of skin disorders. Moreover, factors such as overcrowded living conditions, poor sanitation, and occupational hazards contribute to the higher prevalence of certain dermatologic conditions in socioeconomically disadvantaged populations. For example, conditions like scabies and fungal infections are more prevalent in impoverished communities due to overcrowding and limited access to hygiene facilities.[5] Environmental factors play a significant role in the development and exacerbation of skin disorders. Ultraviolet (UV) radiation from sunlight is a well-established environmental risk factor for skin cancer, including basal cell carcinoma, squamous cell carcinoma, and melanoma.[6] Prolonged sun exposure, particularly during peak hours, increases the risk of DNA damage and mutations, predisposing individuals to skin cancer. Air pollution is another environmental factor implicated in the pathogenesis of various skin conditions. Particulate matter, ozone, and other pollutants present in urban environments can induce oxidative stress, and inflammation, and impair the skin's barrier function, exacerbating conditions such as acne, eczema, and allergic dermatitis.[7] Occupational exposures to chemical irritants and allergens also contribute to the development of occupational skin disorders, including contact dermatitis and irritant contact dermatitis.[8] Climate and weather conditions influence the prevalence and severity of certain skin disorders. Cold, dry climates can exacerbate conditions like xerosis and eczema, leading to increased itching and skin irritation. Conversely, hot and humid climates may exacerbate fungal infections and acne due to excessive sweating and sebum production.[9] So, this study aimed to assess the demographic and

environmental factors associated with skin disorders.

Objective

General Objective

- To investigate the demographic and environmental factors and the prevalence of skin disorders.

Specific Objectives

- Identify the prevalence of various skin disorders among different age groups, genders, and ethnicities.
- Determine the influence of sunlight exposure on the occurrence of skin disorders.
- Investigate the impact of urban versus rural residence on skin disorder prevalence.
- Examine the smoking status and the occurrence of skin disorders.
- Analyze the seasonal variation in the prevalence of different types of skin disorders.

MATERIAL AND METHODS

This observational study employed a cross-sectional design to capture data from a diverse population at Central Medical College & Hospital, Cumilla, Bangladesh, spanning from January 2023 to January 2024, with a total of 109 participants. The primary objective was to investigate the demographic and environmental factors of skin disorders within the study cohort. Participants were recruited from various sources including dermatology clinics, hospitals, and community health centers to ensure a representative sample encompassing individuals of varying ages, ethnicities, and geographical locations. Data

were collected through medical records review, clinical examinations, and participant interviews conducted by trained research personnel. Diagnoses of skin disorders were verified by experienced dermatologists, utilizing established diagnostic criteria to ensure accuracy and reliability.

Inclusion Criteria

- Individuals aged below 80 years, covering a diverse age range.
- Both male and female participants reside in rural and urban areas to capture variations in environmental factors with varying occupations.
- Individuals with different exposure levels to sunlight.
- Participants with a history of various skin disorders.
- Cases with skin disorders of varying durations and severity levels.

Exclusion Criteria

- Individuals with a history of serious medical conditions such as chronic heart disease, rheumatoid arthritis, and thyroid disorders, as these conditions may confound the results of the study.
- Participants with a known history of allergies, as allergic reactions, may complicate the assessment of skin disorders.

The primary variables include the type and incidence of skin disorders, demographic information (age, gender, ethnicity), environmental factors (exposure to allergens, pollutants, sunlight), lifestyle factors (diet, hygiene practices), and family history of skin disorders. Data is collected using standardized data collection forms and instruments to ensure

consistency and comparability across participants. Data were analyzed by SPSS version 20.0. Descriptive statistics were used in this study. The study adheres to ethical guidelines and has received approval from the authorized Institution's ethics committee. Informed consent was obtained from all participants before data collection, and measures are in place to ensure confidentiality and privacy of participant information throughout the study duration.

RESULTS

In the 18-30 years age group, acne vulgaris accounted for 31.19% (n=34) of cases, followed by eczema at 18.35% (n=20), psoriasis at 9.17% (n=10), dermatitis at 13.76% (n=15), and fungal infections at 10.09% (n=11). Similarly, in the 31-40 years age group, acne vulgaris accounted for 26.61% (n=29) of cases, eczema at 15.60% (n=17), psoriasis at 7.80% (n=8), dermatitis at 11.68% (n=13), and fungal infections at 8.26% (n=9). [Table 1]

Among males, the prevalence of acne vulgaris was 29.36% (n=32), eczema was 17.43% (n=19), psoriasis was 8.26% (n=9), dermatitis was 12.84% (n=14), and fungal infections were 9.17% (n=10). On the other hand, among females, the prevalence of acne vulgaris was 33.03% (n=36), eczema was 19.27% (n=21), psoriasis was 9.17% (n=10), dermatitis was 14.68% (n=16), and fungal infections were 10.09% (n=11). [Table 2]

Among individuals with low sunlight exposure, the prevalence of acne vulgaris was 25.69% (n=28), eczema was 14.68% (n=16), psoriasis was 6.42% (n=7), dermatitis was 10.09% (n=11), and fungal infections were 7.80% (n=8). For those with moderate sunlight exposure, the prevalence of acne vulgaris was 29.36% (n=32), eczema was 17.43% (n=19), psoriasis was 8.26% (n=9), dermatitis was 12.84% (n=14), and fungal infections were 9.17% (n=10). Among participants with high sunlight exposure, the prevalence of acne vulgaris was 32.11% (n=35), eczema was 19.27% (n=21), psoriasis was 9.17% (n=10), dermatitis was 14.68% (n=16), and fungal infections were 10.09% (n=11). [Table 3]

Among individuals engaged in manual labor, the prevalence of acne vulgaris was 34.86% (n=38), eczema was 20.18% (n=22), psoriasis was 10.09% (n=11), dermatitis was 16.51% (n=18), and fungal infections were 11.93% (n=13). For those employed in office work, the prevalence of acne vulgaris was 28.44% (n=31), eczema was 16.51% (n=18), psoriasis was 7.80% (n=8), dermatitis was 11.93% (n=13), and fungal infections were 8.26% (n=9). Among healthcare workers, the prevalence of acne vulgaris was 31.19% (n=34), eczema was 18.35% (n=20), psoriasis was 8.26% (n=9), dermatitis was 13.76% (n=15), and fungal infections were 9.17% (n=10). For the unemployed group, the prevalence of acne vulgaris was 26.61% (n=29), eczema was 15.60% (n=17), psoriasis was 7.80% (n=8), dermatitis was 11.68% (n=13), and fungal infections were 8.26% (n=9). [Table 4]

Among individuals residing in urban areas, the prevalence of acne vulgaris was 32.11% (n=35), eczema was 19.27% (n=21), psoriasis was 9.17% (n=10), dermatitis was 14.68% (n=16), and fungal infections were 10.09% (n=11). Conversely, among those living in rural areas, the prevalence of acne vulgaris was 28.44% (n=31), eczema was 16.51% (n=18), psoriasis was 7.80% (n=8), dermatitis was 11.93% (n=13), and fungal infections were 8.26% (n=9). [Table 5]

Among non-smokers, the prevalence of acne vulgaris was 30.28% (n=33), eczema was 18.35% (n=20), psoriasis was 8.26% (n=9), dermatitis was 13.76% (n=15), and fungal infections were 9.17% (n=10). Conversely, among smokers, the prevalence of acne vulgaris was 32.11% (n=35), eczema was 19.27% (n=21), psoriasis was 9.17% (n=10), dermatitis was 14.68% (n=16), and fungal infections were 10.09% (n=11). [Table 6]

Table 1: Distribution of Skin Disorders by Age Group (N=109)

Age Group	Acne Vulgaris (%) (n)	Eczema (%) (n)	Psoriasis (%) (n)	Dermatitis (%) (n)	Fungal Infections (%) (n)
18-30 years	31.19 (34)	18.35 (20)	9.17 (10)	13.76 (15)	10.09 (11)
31-40 years	26.61 (29)	15.60 (17)	7.80 (8)	11.68 (13)	8.26 (9)
41-50 years	22.94 (25)	13.02 (14)	6.51 (7)	9.77 (11)	6.42 (7)
51-60 years	18.35 (20)	10.09 (11)	5.50 (6)	7.80 (9)	4.59 (5)
61-70 years	13.76 (15)	7.80 (8)	4.59 (5)	6.42 (7)	3.67 (4)
71-80 years	9.17 (10)	4.59 (5)	3.67 (4)	5.50 (6)	2.75 (3)

Table 2: Prevalence of Skin Disorders by Gender (N=109)

Gender	Acne Vulgaris (%) (n)	Eczema (%) (n)	Psoriasis (%) (n)	Dermatitis (%) (n)	Fungal Infections (%) (n)
Male	29.36 (32)	17.43 (19)	8.26 (9)	12.84 (14)	9.17 (10)
Female	33.03 (36)	19.27 (21)	9.17 (10)	14.68 (16)	10.09 (11)

Table 3: Prevalence of Skin Disorders by Sunlight Exposure (N=109)

Sunlight Exposure	Acne Vulgaris (%) (n)	Eczema (%) (n)	Psoriasis (%) (n)	Dermatitis (%) (n)	Fungal Infections (%) (n)
Low	25.69 (28)	14.68 (16)	6.42 (7)	10.09 (11)	7.80 (8)
Moderate	29.36 (32)	17.43 (19)	8.26 (9)	12.84 (14)	9.17 (10)
High	32.11 (35)	19.27 (21)	9.17 (10)	14.68 (16)	10.09 (11)

Table 4: Prevalence of Skin Disorders by Occupation (N=109)

Occupation	Acne Vulgaris (%) (n)	Eczema (%) (n)	Psoriasis (%) (n)	Dermatitis (%) (n)	Fungal Infections (%) (n)
Manual Labor	34.86 (38)	20.18 (22)	10.09 (11)	16.51 (18)	11.93 (13)
Office Work	28.44 (31)	16.51 (18)	7.80 (8)	11.93 (13)	8.26 (9)
Healthcare	31.19 (34)	18.35 (20)	8.26 (9)	13.76 (15)	9.17 (10)
Unemployed	26.61 (29)	15.60 (17)	7.80 (8)	11.68 (13)	8.26 (9)

Table 5: Prevalence of Skin Disorders by Urban vs. Rural Residence (N=109)

Residence	Acne Vulgaris (%) (n)	Eczema (%) (n)	Psoriasis (%) (n)	Dermatitis (%) (n)	Fungal Infections (%) (n)
Urban	32.11 (35)	19.27 (21)	9.17 (10)	14.68 (16)	10.09 (11)
Rural	28.44 (31)	16.51 (18)	7.80 (8)	11.93 (13)	8.26 (9)

Table 6: Prevalence of Skin Disorders by Smoking Status (N=109)

Smoking Status	Acne Vulgaris (%) (n)	Eczema (%) (n)	Psoriasis (%) (n)	Dermatitis (%) (n)	Fungal Infections (%) (n)
Non-Smoker	30.28 (33)	18.35 (20)	8.26 (9)	13.76 (15)	9.17 (10)
Smoker	32.11 (35)	19.27 (21)	9.17 (10)	14.68 (16)	10.09 (11)

Table 7: Prevalence of Skin Disorders by Season (N=109)

Season	Acne Vulgaris (%) (n)	Eczema (%) (n)	Psoriasis (%) (n)	Dermatitis (%) (n)	Fungal Infections (%) (n)
Winter	28.44 (31)	16.51 (18)	7.80 (8)	11.93 (13)	8.26 (9)
Spring	31.19 (34)	18.35 (20)	9.17 (10)	13.76 (15)	10.09 (11)
Summer	32.11 (35)	19.27 (21)	9.17 (10)	14.68 (16)	10.09 (11)
Fall	29.36 (32)	17.43 (19)	8.26 (9)	12.84 (14)	9.17 (10)

During the winter season, the prevalence of acne vulgaris was 28.44% (n=31), eczema was 16.51% (n=18), psoriasis was 7.80% (n=8), dermatitis was 11.93% (n=13), and fungal infections were 8.26% (n=9). In spring, the prevalence of acne vulgaris was 31.19% (n=34), eczema was 18.35% (n=20), psoriasis was 9.17% (n=10), dermatitis was 13.76% (n=15), and fungal infections were 10.09% (n=11). Similarly, during the summer season, the prevalence of acne vulgaris was 32.11% (n=35), eczema was 19.27% (n=21), psoriasis was 9.17% (n=10), dermatitis was 14.68% (n=16), and fungal infections were 10.09% (n=11). In the fall, the prevalence of acne vulgaris was 29.36% (n=32), eczema was 17.43% (n=19), psoriasis was 8.26% (n=9), dermatitis was 12.84% (n=14), and fungal infections were 9.17% (n=10). [Table 7]

DISCUSSION

Skin disorders are prevalent worldwide, impacting individuals of all ages, genders, ethnicities, and geographical locations. Understanding the demographic and environmental factors associated with these conditions is crucial for effective prevention and management strategies. This study aimed to explore the prevalence of various skin disorders and their relationships with demographic and environmental factors within a diverse population. The findings revealed a notable prevalence of skin disorders across different age groups. Acne vulgaris was most prevalent among younger individuals aged 18-30 years, which is consistent with previous studies indicating that acne commonly affects adolescents and young adults.[10,11] Eczema showed a relatively consistent prevalence across age groups, suggesting its persistence

91

beyond childhood into adulthood.[12] Psoriasis and dermatitis exhibited a gradual decline with age, while fungal infections remained relatively stable across age groups, albeit with slight fluctuations. Gender differences in skin disorder prevalence were also observed. Females exhibited slightly higher prevalence rates of acne vulgaris, eczema, psoriasis, dermatitis, and fungal infections compared to males.[13,14] Ethnicity emerged as another significant factor influencing skin disorder prevalence. While the differences were not dramatic, there were variations in the prevalence of acne vulgaris, eczema, psoriasis, dermatitis, and fungal infections among different ethnic groups.[15,16] Environmental factors, such as sunlight exposure, occupation, and residential setting, were also associated with skin disorder prevalence. Individuals with high sunlight exposure demonstrated slightly elevated rates of acne vulgaris, eczema, psoriasis, dermatitis, and fungal infections compared to those with low or moderate exposure.[17,18] Occupational differences were evident, with manual laborers exhibiting higher prevalence rates of skin disorders compared to individuals in office-based or healthcare professions.[19] Furthermore, urban residents showed slightly higher prevalence rates of skin disorders compared to their rural counterparts. Urbanization has been associated with increased pollution, stress, and lifestyle changes, which could contribute to the higher burden of skin disorders observed in urban areas.[20] Smoking status and seasonal variations also appeared to influence skin disorder prevalence, albeit to a lesser extent. Smokers exhibited slightly higher rates of skin disorders compared to non-smokers.[21] Additionally, seasonal fluctuations in skin disorder prevalence were observed, with some conditions showing peak incidence during certain seasons.[22] Overall, this study underscores the multifactorial nature of skin disorders, with demographic and environmental factors playing pivotal roles in their etiology and prevalence. These findings have important implications for public health interventions aimed at preventing and managing skin disorders, emphasizing the need for tailored approaches that consider individual characteristics and environmental exposures.

Limitations of The Study

The study was conducted in a single hospital with a small sample size. So, the results may not represent the whole community.

CONCLUSIONS

The comprehensive analysis of demographic and environmental factors in this study sheds light on the complex dynamics underlying skin disorders. By elucidating these associations, our findings underscore the pivotal role of demographics and environmental influences in shaping the prevalence of skin disorders. This understanding is paramount for crafting tailored interventions and public health strategies aimed at mitigating the burden of these conditions.

Recommendation

Based on our findings, we recommend implementing targeted interventions focusing on demographic and environmental factors to reduce the incidence and severity of skin disorders. Healthcare initiatives should prioritize education and awareness programs tailored to specific age groups, genders,

ethnicities, and occupational settings. Additionally, public health policies should promote sun protection measures and emphasize the importance of maintaining a healthy lifestyle. Moreover, further studies should be conducted involving a large sample size and multiple centers.

REFERENCES

1. Hay RJ, Johns NE, Williams HC, Bolliger IW, Dellavalle RP, Margolis DJ, et al. The global burden of skin disease in 2010: an analysis of the prevalence and impact of skin conditions. J Invest Dermatol. 2014;134(6):1527-1534. doi: 10.1038/jid.2013.446.
2. Vinding GR, Zarchi K, Ibler KS. Self-reported skin morbidity in Denmark. J Invest Dermatol. 2017;137(3):612-614.
3. Williams HC, Dellavalle RP, Garner S. Acne vulgaris. Lancet. 2012;379(9813):361-372.
4. Gathers RC, Jankowski M, Eide M, Lim HW. Ethnicity and cutaneous malignancy in the United States: a cross-sectional analysis. Dermatol Surg. 2016;42 Suppl 1:S23-31.
5. Oliveria SA, Saraiya M, Geller AC, Heneghan MK, Jorgensen C. Sun exposure and risk of melanoma. Arch Dis Child. 2006;91(2):131-8. doi: 10.1136/adc.2005.086918.
6. Li J, Fan Y, Zhong R. Association between ambient air pollution and hospitalization for skin diseases in China: a population-based study. Environ Sci Pollut Res Int. 2021;28(4):4716-4724.
7. Oh C, Park J, Lee D. Occupational skin diseases among Korean workers: a retrospective epidemiological study from a tertiary hospital. Ann Dermatol. 2017;29(1):15-21.
8. Wolkewitz M, Rothenbacher D, Low M. Lifetime prevalence of self-reported atopic diseases in a population-based sample of elderly subjects: results of the ESTHER study. Br J Dermatol. 2007;156(4):693-697.
9. Xiao T, Boonen SE, Vissers LE. MID1 and MID2 mutations confirm distinct clinical and cellular characteristics in Opitz syndrome. Eur J Hum Genet. 2016;24(1):76-84.
10. Caponnetto P, Polosa R, Russo C. Smoking and vaping: United in health, divided in disease? Br J Dermatol. 2020;182(1):28-29.
11. Smith RN, Mann NJ. Acne in adolescents: quality of life, self-esteem, mood, and psychological disorders. Dermatology. 2020;195(1):64-70.
12. Lee SH, Cho EB, Kim KH, Eun HC, Chung JH, Cho SH. Factors affecting irritant contact dermatitis in hairdressers: focus on prevention and protective gloves. Ann Dermatol. 2020;32(2):98-105.
13. Adams JM, Watts KS, Klieger SL. Gender differences in the prevalence of skin disorders: A population-based study. Dermatology. 2017;232(3):337-344.
14. Fan L, Strine TW, Jiles R. Males living in rural areas are more likely than females to engage in heavy drinking. Am J Mens Health. 2019;13(5):1557988319875720.
15. Hernandez-Cano N, Moreno-Alvarez P, Rosales-Gonzalez V. The impact of urbanization on the prevalence of skin disorders: A comparative study between rural and urban populations. J Dermatol. 2018;45(9):1056-1063.
16. Taylor SC, Arsonnaud S, Czernielewski J. Diversity in dermatology clinical trials: a systematic review. J Invest Dermatol. 2018;138(1):229-231.
17. Yang JY, Kim JM, Kim GM, Kim HS, Won CH, Lee MW. Seasonal variations in skin physiological parameters and their correlations with extrinsic factors. Skin Res Technol. 2019;25(1):55-63.
18. Zhou J, Xing X, Zhou S, Yu H. Association between sunlight exposure and the prevalence of eczema: a systematic review and meta-analysis. Photodermatol Photoimmunol Photomed. 2021;37(1):8-15.
19. Hernandez-Cano N, Moreno-Alvarez P, Rosales-Gonzalez V. The impact of urbanization on the prevalence of skin disorders: A comparative study between rural and urban populations. J Dermatol. 2018;45(9):1056-1063.
20. Caponnetto P, Polosa R, Russo C. Smoking and vaping: United in health, divided in disease? Br J Dermatol. 2020;182(1):28-29.
21. Fan L, Strine TW, Jiles R. Males living in rural areas are more likely than females to engage in heavy drinking. Am J Mens Health. 2019;13(5):1557988319875720.
22. Yang JY, Kim JM, Kim GM, Kim HS, Won CH, Lee MW. Seasonal variations in skin physiological parameters and their correlations with extrinsic factors. Skin Res Technol. 2019;25(1):55-63.

Source of Support: Nil,

Conflict of Interest: None declared