

ORIGINAL ARTICLE

Spectrum and distribution of skin disorders among patients attending a tertiary care hospital in Bangladesh

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Abstract

Background: Skin disorders are among the most common causes of outpatient visits worldwide and are particularly prevalent in developing countries due to climatic, socioeconomic, and hygiene-related factors. Local epidemiological data are essential for effective healthcare planning and preventive strategies.

Objectives: To determine the prevalence, pattern, and associated predictors of dermatological disorders among patients attending a tertiary care hospital in Bangladesh.

Methods: This hospital-based cross-sectional observational study was conducted in the dermatology outpatient department of a tertiary care hospital in Bangladesh. A total of 659 patients of all age groups and both sexes were enrolled consecutively following predefined inclusion and exclusion criteria. Detailed demographic and clinical information was collected using a structured data sheet. Dermatological diagnoses were established clinically, supported by laboratory investigations when necessary. Skin disorders were categorized into infectious and non-infectious conditions. Multivariable logistic regression analysis was performed to identify independent predictors of common dermatological disorders. Receiver operating characteristic (ROC) curve analysis was used to evaluate predictive performance. Statistical analysis was conducted using SPSS version 23.0.

Results: Among 659 participants, 81.03% were female, and 18.97% were male. Fungal infection was the most prevalent dermatological disorder (48.55%), followed by scabies (17.14%), itching/urticaria (14.57%), dermatitis (8.49%), and acne vulgaris (5.0%). Increasing age was independently associated with fungal infection and xerosis, while urban residence showed a significant association with fungal infection and urticaria. Scabies was significantly associated with male gender and diabetes mellitus. ROC analysis demonstrated the highest predictive accuracy for acne (AUC=0.818) and seborrheic dermatitis (AUC=0.761).

Conclusion: Infectious dermatoses remain highly prevalent in Bangladesh, with fungal infections representing the major disease burden. Demographic, environmental, and metabolic factors significantly influence dermatological disease patterns, highlighting the need for improved public awareness and preventive dermatological care.

Keywords: skin disorders; prevalence; fungal infections; scabies; dermatitis; Bangladesh

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Introduction

Skin diseases are among the most common medical conditions worldwide, but are more prevalent in developing countries.¹⁻³ Although many dermatological conditions are not life-threatening, they often cause considerable discomfort, cosmetic concern, and psychological distress.^{4,5}

The epidemiology of skin disorders varies widely depending on climatic conditions, socioeconomic factors, hygiene practices, and accessibility to healthcare facilities. In tropical and developing countries, infectious dermatoses such as fungal infections, scabies, and bacterial infections are particularly prevalent due to warm and humid climates, overcrowding, and poor sanitation.⁵⁻⁷

Previous studies have demonstrated that skin diseases account for a substantial proportion of outpatient visits in hospitals. Epidemiological studies conducted in different regions have reported varying prevalence rates for dermatological conditions, highlighting the importance of local data for healthcare planning.

Understanding the pattern and frequency of dermatological diseases in a particular population is essential for developing preventive strategies and improving dermatological services. Therefore, the present study aimed to determine the prevalence and pattern of skin disorders among patients attending a tertiary care hospital.

Methods

Study Design and Setting: This hospital-based cross-sectional observational study was conducted

in the Department of Dermatology of a tertiary care hospital in Bangladesh. The study was carried out among patients attending the dermatology outpatient department (OPD) with various dermatological complaints during the study period. The study aimed to determine the prevalence and pattern of dermatological disorders among patients seeking dermatological care in a tertiary healthcare setting.

The study population consisted of patients of all age groups and both genders who attended the dermatology outpatient department during the study period. A total of 659 participants were enrolled consecutively after fulfilling the eligibility criteria.

Eligibility Criteria: The following participants were included in the study:

- Patients of all ages and both sexes presenting with dermatological disorders.
- Patients willing to participate and provide written informed consent.
- Patients undergoing a complete dermatological evaluation and necessary investigations.
- For participants below 18 years of age, consent was obtained from parents or legal guardians.

The following participants were excluded from the study:

- Patients unwilling to participate or refuse consent.
- Patients with incomplete demographic or clinical data.
- Critically ill patients unable to undergo proper clinical evaluation.

- Follow-up cases previously included in the study to avoid duplication of data.
- Patients with uncertain or inconclusive dermatological diagnoses.

Sample Size and Sampling: A consecutive sampling technique was used to recruit participants attending the dermatology outpatient department during the study period. A total of 659 eligible patients were included in the final analysis.

Data were collected using a predesigned structured data collection sheet. Detailed demographic information, including age, gender, marital status, occupation, educational status, residence, socioeconomic condition, and body mass index (BMI), was recorded.

Each participant underwent detailed history taking and a complete dermatological examination performed by qualified physicians. Information regarding presenting complaints, duration of illness, associated symptoms, previous treatment history, personal hygiene practices, and relevant medical history was obtained.

Clinical diagnosis of dermatological disorders was established primarily through physical examination and clinical assessment. Where necessary, laboratory investigations such as skin scrapings, fungal microscopy, blood glucose testing, or other relevant investigations were performed to support the diagnosis.

The diagnosed skin disorders were categorized into infectious and non-infectious dermatological conditions. Infectious dermatoses included fungal, bacterial, viral, and parasitic infections, while non-infectious conditions included dermatitis, acne, urticaria, pigmentary disorders, autoimmune conditions, and pregnancy-related dermatoses.

Collected data were checked daily for completeness, consistency, and accuracy. Incomplete records and duplicate entries were excluded before final analysis. Data cleaning procedures were performed before statistical analysis to minimize entry errors and ensure data validity.

Outcome Assessment: The prevalence of each dermatological disorder was calculated and expressed as a percentage of the total study population. Stratified

analyses according to gender and other demographic variables were also performed where applicable.

To identify independent predictors of dermatological disorders, multivariable binary logistic regression analysis was performed for the common skin diseases observed in the study population. The dependent variables included the presence or absence of specific dermatological conditions such as fungal infection, scabies, urticaria, dermatitis, bacterial infection, viral infection, acne, seborrheic dermatitis, and other selected disorders. Independent variables entered into the regression models included age, gender, obesity status, residence, educational status, and diabetes mellitus status.

Adjusted odds ratios (ORs) with 95% confidence intervals (CIs) were calculated to determine the strength of association between predictor variables and dermatological disorders. Variables with sparse event frequency or insufficient case numbers were interpreted cautiously because of limited statistical power and model instability.

Receiver operating characteristic (ROC) curve analysis was subsequently performed to evaluate the discriminative performance of the multivariable logistic regression models. The area under the ROC curve (AUC) was calculated for each model to assess predictive accuracy. An AUC value of 0.5 indicated no discriminative ability, values between 0.6 and 0.7 indicated modest discrimination, values between 0.7 and 0.8 indicated acceptable discrimination, and values above 0.8 indicated excellent predictive performance.

All statistical analyses were performed using the Statistical Package for Social Sciences (SPSS) version 23.0 (IBM Corp., Armonk, NY, USA), where $\alpha = 0.05$. Continuous variables were summarized using mean, standard deviation, minimum, and maximum values where appropriate. Categorical variables were presented as frequencies and percentages.

Ethical considerations: Written informed consent was obtained from all participants before enrollment in the study. For participants below 18 years of age, consent was obtained from parents or legal guardians. Confidentiality and anonymity of the participants were strictly maintained throughout the study by de-identifying all collected data.

The study was conducted in accordance with the ethical principles of the Declaration of Helsinki 1964 (revised version).

Results

A total of 659 participants were included in the study, comprising 125 males (18.97%) and 534 females (81.03%). Most patients belonged to the 26–40 years age group, followed by the 19–25 years age group. Skin disorders were more common among married individuals, urban residents, obese participants, those from middle and lower-middle socioeconomic classes, and individuals with lower educational status. Homemakers constituted a major proportion of the affected population, particularly for infectious dermatoses and dermatitis.

Fungal infection was the most prevalent dermatological disorder, affecting 48.55% of participants,

predominantly presenting as tinea infections. Scabies (17.14%) and itching/urticaria (14.57%) were the next most common conditions. Dermatitis accounted for 8.49% of cases, while acne vulgaris was observed in 5.0% of participants. Other relatively common disorders included seborrheic dermatitis (2.7%), xerosis (2.27%), and melasma (2.12%). Pregnancy-related dermatoses such as prurigo gravidarum (1.21%) and polymorphic eruption of pregnancy (1.06%) occurred exclusively among female participants. Less frequent conditions, including vitiligo, psoriasis, alopecia, eruptive xanthoma, and acanthosis nigricans, were each observed in less than 1% of cases (Table 1) (Figure 1).

Table 1. Types of skin disorders

Skin disorders	Male (n=125)	Female (n=534)	Total (n=659)
Xerosis	4 (3.20%)	11 (2.05%)	15 (2.27%)
Itching/Urticaria	19 (15.20%)	77 (14.41%)	96 (14.57%)
Pruritus due to cholestasis	0	2 (0.37%)	2 (0.30%)
Fungal infection	51 (40.80%)	269 (50.37%)	320 (48.55%)
Bacterial infection	3 (2.40%)	18 (3.37%)	21 (3.18%)
Viral infection	3 (2.40%)	7 (1.31%)	10 (1.51%)
Skin tag	0	2 (0.37%)	2 (0.30%)
Acanthosis nigricans	0	1 (0.19%)	1 (0.15%)
Diabetic bulla	0	2 (0.37%)	2 (0.30%)
PUPPP	0	7 (1.31%)	7 (1.06%)
Eruptive xanthoma	0	1 (0.19%)	1 (0.15%)
Scabies	31 (24.80%)	82 (15.35%)	113 (17.14%)
Seborrheic dermatitis	7 (5.60%)	11 (2.05%)	18 (2.70%)
Acne	5 (4.00%)	28 (5.20%)	33 (5.00%)
Dermatitis	13 (10.40%)	43 (8.05%)	56 (8.49%)
Prurigo gravidarum	0	8 (1.49%)	8 (1.21%)
Melasma	3 (2.40%)	11 (2.05%)	14 (2.12%)
Other	6 (4.80%)	26 (4.87%)	32 (4.85%)
Hair fall	1 (0.80%)	4 (0.75%)	5 (0.76%)
Milliaria rubra	0	11 (2.05%)	11 (1.66%)
Vitiligo	1 (0.80%)	3 (0.56%)	4 (0.61%)
Alopecia	3 (2.40%)	1 (0.19%)	4 (0.61%)
Hirsutism	0	1 (0.19%)	1 (0.15%)
Psoriasis	1 (0.80%)	3 (0.56%)	4 (0.61%)

PUPPP - Pruritic Urticarial Papules and Plaques of Pregnancy

PREVALENCE OF DERMATOLOGICAL DISORDERS (%)

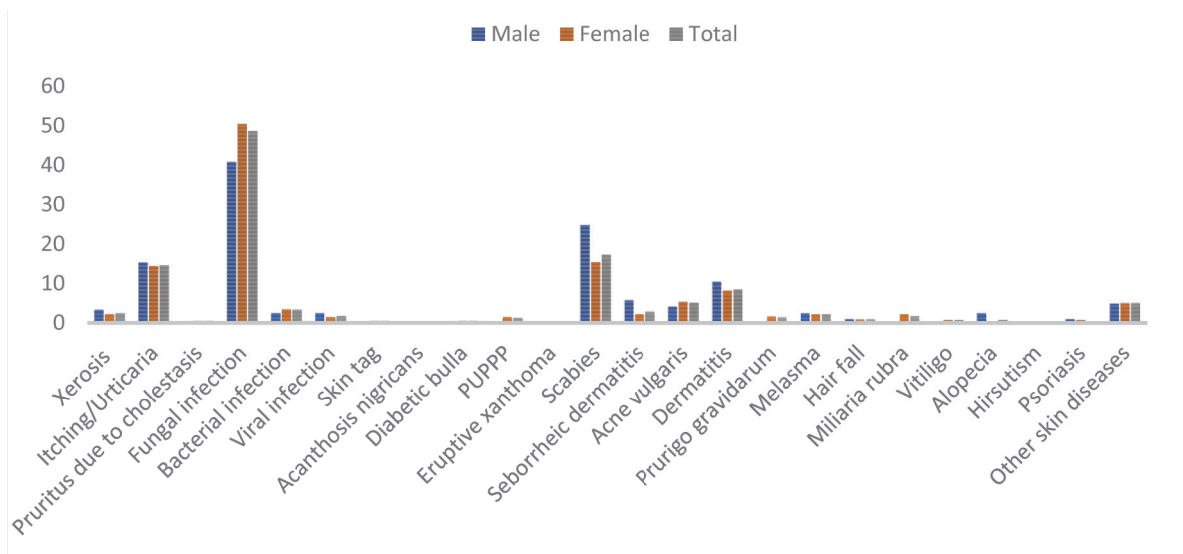


Figure 1. Prevalence of Dermatological Disorders.

Multivariable logistic regression analysis demonstrated significant associations between several demographic and clinical variables and dermatological disorders. Increasing age was independently associated with xerosis and fungal infections. Urban residence was significantly associated with fungal infection and itching/urticaria. Obesity demonstrated a positive trend toward fungal and inflammatory skin disorders,

although not all associations remained statistically significant after adjustment. Seborrheic dermatitis appeared more common among males, whereas acne vulgaris predominated among younger individuals. Due to a small sample size, uncommon conditions such as acanthosis nigricans, diabetic bulla, eruptive xanthoma, hirsutism, and pregnancy-related dermatoses could not be robustly modeled (Table 2).

Table 2. Multivariable logistic regression analysis of demographic, socioeconomic, and metabolic predictors of dermatological disorders

Outcome	Predictor	OR	95% CI Lower	95% CI Upper	P value
Xerosis	Age	1.086	1.029	1.145	0.0025
	Obesity	0.739	0.285	1.918	0.5348
	Residence	1.11	0.518	2.379	0.7892
	Education	0.878	0.493	1.562	0.6576
	Diabetes	0.17	0.017	1.723	0.1337
Urticaria	Male gender	1.076	0.597	1.941	0.807
	Age	1.008	0.988	1.029	0.4313
	Obesity	1.12	0.845	1.486	0.4303
	Residence	0.655	0.468	0.917	0.0137
	Education	1.187	0.961	1.467	0.1115
	Diabetes	0.709	0.34	1.479	0.3592

(Continued)

Outcome	Predictor	OR	95% CI Lower	95% CI Upper	P value
Fungal infection	Male gender	0.737	0.462	1.177	0.2016
	Age	1.023	1.006	1.04	0.0067
	Obesity	0.822	0.655	1.033	0.0927
	Residence	1.416	1.12	1.791	0.0036
	Education	0.959	0.815	1.129	0.6186
	Diabetes	0.785	0.46	1.341	0.3753
Bacterial infection	Male gender	0.601	0.165	2.19	0.4406
	Age	1.001	0.958	1.046	0.9608
	Obesity	1.054	0.604	1.837	0.8536
	Residence	1.161	0.645	2.093	0.6184
	Education	0.622	0.404	0.956	0.0304
	Diabetes	0.614	0.127	2.985	0.5459
Viral infection	Age	1.038	0.983	1.096	0.1834
	Obesity	1.277	0.562	2.902	0.5594
	Residence	1.121	0.468	2.687	0.7973
	Education	1.022	0.556	1.878	0.9451
Scabies	Male gender	1.938	1.102	3.408	0.0215
	Age	0.958	0.936	0.981	0.0004
	Obesity	1.025	0.764	1.375	0.8703
	Residence	0.554	0.376	0.815	0.0027
	Education	1.163	0.93	1.455	0.1852
Seborrheic dermatitis	Age	0.947	0.896	1.001	0.0531
	Obesity	0.392	0.152	1.008	0.0519
	Residence	0.897	0.441	1.826	0.7646
	Education	1.469	0.852	2.533	0.1668
Acne	Male gender	0.564	0.183	1.735	0.3174
	Age	0.875	0.812	0.943	0.0005
	Obesity	1.109	0.703	1.75	0.6566
	Residence	0.703	0.363	1.358	0.2939
	Education	0.7	0.454	1.079	0.1065
Dermatitis	Age	1.022	0.992	1.053	0.1504
	Obesity	0.992	0.637	1.546	0.973
	Residence	0.665	0.394	1.121	0.1253
	Education	1.066	0.778	1.46	0.6921
	Diabetes	0.812	0.289	2.283	0.6924
Hair fall	Age	0.998	0.918	1.086	0.9639
	Obesity	0.381	0.058	2.5	0.3145
	Residence	0.783	0.218	2.808	0.7074
	Education	0.845	0.369	1.933	0.6892

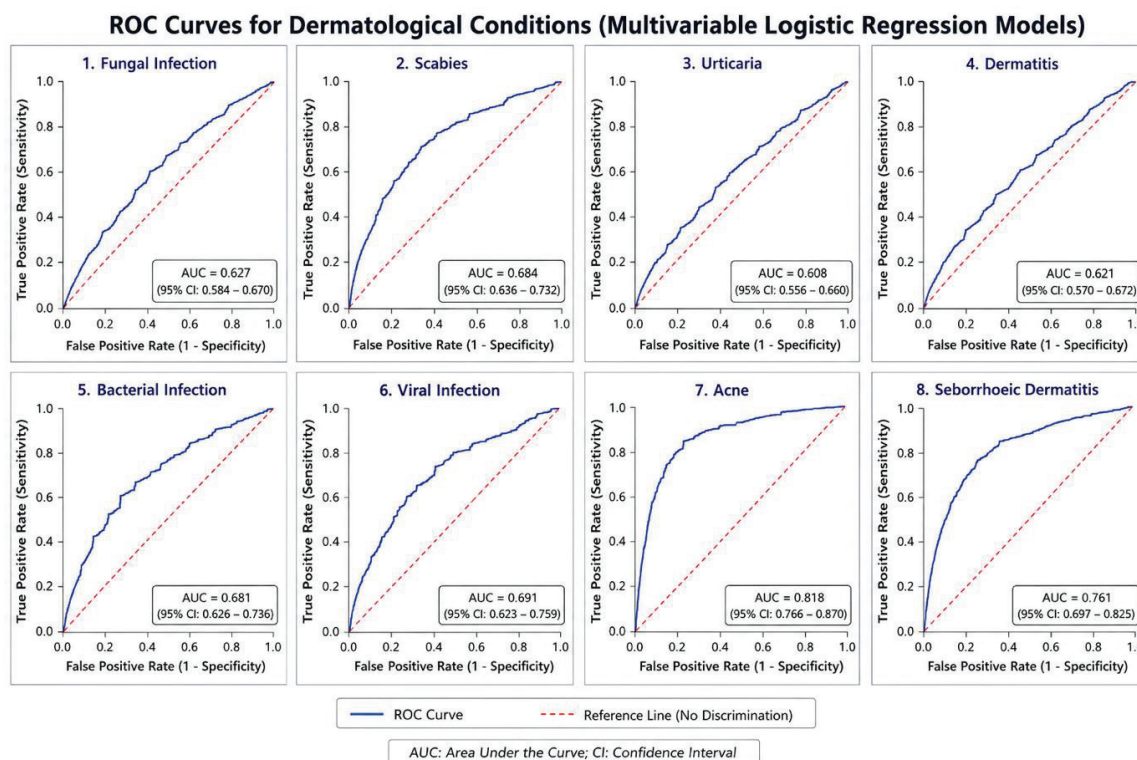


Figure 2. ROC Curve for Dermatological Conditions.

Receiver operating characteristic (ROC) curve analysis demonstrated variable predictive performance of the multivariable models across the most common skin disorders. Acne showed the highest discriminative ability with an area under the curve (AUC) of 0.818, followed by seborrheic dermatitis (AUC=0.761). Viral infection (AUC=0.691), scabies (AUC=0.684), and bacterial infection (AUC=0.681) demonstrated acceptable predictive performance, whereas fungal infection (AUC=0.627), dermatitis (AUC=0.621), and urticaria (AUC=0.608) showed modest discriminative capacity (Figure 2).

Discussion

The present study evaluated the prevalence, demographic distribution, and predictive factors of dermatological disorders among patients attending a tertiary care hospital in Bangladesh. Infectious dermatoses constituted the majority of cases, with fungal infections emerging as the most prevalent condition, followed by scabies and itching/urticaria. These findings are consistent with previous studies conducted in developing and tropical countries, where warm climate, overcrowding, poor hygiene, and socioeconomic factors substantially contribute to the burden of skin diseases.¹⁻⁷

A predominance of female participants was observed in the present study. This finding may reflect greater healthcare-seeking behavior among women, particularly in urban tertiary healthcare settings. However, when gender-specific proportions were considered, several dermatological conditions appeared relatively more common among males, especially seborrheic dermatitis and scabies. Similar observations have been reported in earlier regional studies, suggesting that occupational exposure, hormonal factors, and personal hygiene practices may influence gender variation in skin disease distribution.^{1,4,5,7,8}

Most participants belonged to the 26–40 years age group, followed by the 19–25 years age group. Logistic regression analysis further demonstrated that increasing age was independently associated with xerosis and fungal infections. The higher burden among young and middle-aged adults may be related to increased occupational activity, environmental exposure, sweating, and greater social and cosmetic concern, leading to healthcare consultation.⁹⁻¹¹ Age-related impairment of skin barrier function may also explain the increased likelihood of xerosis among older individuals.³

Socioeconomic and environmental factors appeared to play an important role in dermatological disease occurrence. Higher frequencies of skin disorders were observed among urban residents, obese individuals, homemakers, and participants with lower educational status. Urban residence was significantly associated with fungal infection and itching/urticaria in multivariable analysis. Increased population density, environmental pollution, humidity, overcrowding, and lifestyle-related exposures in urban settings may contribute to this observation. Additionally, limited awareness regarding hygiene and delayed healthcare access among less educated populations may increase disease burden.^{2,4,6,7,9,12-16}

Obesity demonstrated a positive trend toward association with fungal and inflammatory dermatoses. Obesity is known to predispose individuals to dermatological disorders through multiple mechanisms, including increased sweating, skin friction, moisture retention within skin folds, hormonal imbalance, insulin resistance, and chronic low-grade inflammation.^{11,17} These mechanisms create a favorable environment for fungal proliferation and inflammatory skin reactions. The present findings therefore support the growing evidence linking obesity with increased dermatological morbidity.

Fungal infections accounted for nearly half of all dermatological disorders in the present study, with tinea infections being the predominant subtype. Similar findings have been widely reported in tropical countries, including Bangladesh, India, and other South Asian regions.^{1,14,16} Warm, humid climate, overcrowding, poor personal hygiene, and irrational use of topical steroid-containing creams may contribute to the rising prevalence of dermatophytosis. Scabies was the second most common condition, reflecting the continuing public health burden of parasitic infestations in resource-limited settings.^{1,2,18}

Itching/urticaria and dermatitis also represented a substantial proportion of cases. These conditions are likely associated with allergic sensitization, irritant exposure, environmental pollutants, detergents, and occupational factors. Homemakers in particular appeared more vulnerable to dermatitis and infectious skin diseases, possibly because of repeated exposure to water, cleaning agents, and household chemicals.

Acne vulgaris was observed predominantly among younger individuals, which is consistent with its hormonal pathophysiology.¹⁹ Seborrheic dermatitis appeared more common among males, likely reflecting androgen-mediated sebaceous gland activity.²⁰ Pregnancy-related dermatoses, including prurigo gravidarum and polymorphic eruption of pregnancy, were observed exclusively among female participants, as expected.

The present study also incorporated multivariable logistic regression and receiver operating characteristic (ROC) curve analysis to evaluate independent predictors and predictive performance of common dermatological disorders. ROC analysis demonstrated excellent discriminative ability for acne (AUC=0.818) and good predictive performance for seborrheic dermatitis (AUC=0.761). Viral infection, bacterial infection, and scabies demonstrated acceptable predictive capacity, whereas fungal infection, dermatitis, and urticaria showed modest predictive performance. These findings suggest that demographic, environmental, and metabolic variables may be more strongly associated with certain dermatological conditions than others.

Several relatively uncommon disorders, including vitiligo, psoriasis, alopecia, eruptive xanthoma, acanthosis nigricans, diabetic bulla, and hirsutism, were identified in small proportions of participants. Although infrequent, these conditions remain clinically important because of their chronic nature, cosmetic implications, and potential association with systemic metabolic disorders.

Limitations

This study has several limitations. First, it was conducted in a single tertiary care hospital, which may limit the generalizability of the findings to the broader population of Bangladesh. In particular, the study was performed at Ad-din Women's Medical College, an institutional women-centered medical college and hospital, which likely contributed to the marked predominance of female participants (81.03%) in the study population. Although women may generally demonstrate greater healthcare-seeking behavior, the institutional setting itself introduced an important selection bias by disproportionately attracting female patients and female-oriented healthcare utilization patterns. Consequently, the study denominator was substantially skewed toward women, and

the observed demographic distribution may not accurately represent the true gender distribution of dermatological disorders in the general Bangladeshi population.

This institutional selection bias may also have influenced the relative frequencies of specific dermatological conditions, particularly disorders unique to or more prevalent among women, including pregnancy-related dermatoses, melasma, and certain inflammatory skin conditions. Therefore, caution should be exercised when extrapolating the gender-specific prevalence estimates and demographic patterns to community-based or nationally representative populations.

Second, diagnoses were primarily based on clinical evaluation without extensive laboratory confirmation in all cases, which may have introduced a degree of diagnostic misclassification. Third, the cross-sectional design limits the ability to establish temporal or causal relationships between demographic or metabolic risk factors and dermatological disorders. Additionally, some relatively uncommon conditions had small case numbers, reducing statistical power and limiting the robustness of multivariable modeling for those disorders.

Future multicenter, community-based studies involving both general and gender-balanced healthcare settings are recommended to provide more representative epidemiological data on skin diseases in Bangladesh.

Conclusion

The findings of the present study highlight that infectious dermatoses remain a major public health concern in Bangladesh. Demographic characteristics, environmental exposure, obesity, and socioeconomic conditions appear to substantially influence the occurrence of dermatological disorders. Strengthening public awareness regarding hygiene, obesity prevention, early diagnosis, and appropriate dermatological care may help reduce the burden of skin diseases in the community.

Ethics statement

Written informed consent was obtained from all participants prior to enrolment. The statement also assures that the study was conducted following the “Declaration of Helsinki 1964 (Revised)”.

Author contributions

K.R. and M.M.S. conceived the idea and planned the study. K.R., M.M.S., F.T.J., F.Y., K.B., and S.M.R. were involved in data collection. M.M.S. performed the data processing, carried out the calculations, and was responsible for writing and reviewing the manuscript. All authors have read and approved the final version of the manuscript.

Data availability

The data that support the findings of this study are openly available in “Mendeley Data” at [doi: 10.17632/jg43jzb9w2.1](https://doi.org/10.17632/jg43jzb9w2.1).

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