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ORIGINAL ARTICLE

Pattern of Skin Diseases and their Impact on Quality of Life Among Adults Attending the Dermatology Clinic at Muhimbili National Hospital, Tanzania

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ABSTRACT

Background: Skin diseases contribute substantially to morbidity worldwide and are associated with impaired health-related quality of life (HRQoL). In sub-Saharan Africa, clinico-epidemiological data remain scarce despite the high burden of dermatological conditions.

Objective: To determine the pattern of skin diseases, associated sociodemographic and clinical factors, and their impact on HRQoL among adults attending the dermatology clinic at Muhimbili National Hospital, Tanzania.

Methods: A hospital-based cross-sectional study was conducted at Muhimbili National Hospital, Dar es Salaam, from September 2021 to January 2022. Adults (≥18 years) attending the dermatology clinic were consecutively recruited. Diagnoses were made clinically and supported by laboratory examination (e.g., fungal microscopy, bacterial culture, biopsies) where necessary. Conditions were classified using ICD-10 groupings. Health-related quality of life was assessed using the validated Swahili version of the Dermatology Life Quality Index (DLQI). Data were analysed using SPSS v23. Associations were tested using the chi-square test and odds ratios (95% CI); $p<.05$ was considered statistically significant.

Results: A total of 378 participants were enrolled; 158 (41.8%) were male, with an overall median age of 34 years (IQR 26–49). The most common disease categories were eczemas and urticaria 146 (38.6%), disorders of skin appendages 43 (11.4%), autoimmune diseases 38 (10.1%), fungal infections 30 (7.9%), benign neoplasms 23 (6.1%), bacterial infections 22 (5.8%), and viral infections 18 (4.8%). Skin diseases were significantly associated with sex, age, education level, depression, family history, endocrine disorders, and seasonal variation. The mean DLQI score was 9.7 ± 6.5, indicating moderate impairment. Notably, 43.7% of patients reported a very large or extremely large impact, particularly in domains related to work performance, symptoms, and clothing choices.

Conclusion: Eczema and urticaria were the most prevalent conditions and had a substantial negative impact on patients' health-related quality of life (HRQoL). Integrating routine HRQoL assessments, psychosocial support, and comorbidity screening into dermatology care is therefore recommended. Policymakers should prioritise the prevention and management of skin diseases, and future community-based studies, supported by laboratory confirmation, are needed to improve generalisability and diagnostic accuracy.

BACKGROUND

The skin, as the largest organ of the human body, plays a critical role in maintaining health by preventing dehydration, infection, and injury. Beyond its physiological functions, it also shapes physical appearance and personal identity, acting as a primary interface between individuals and their environment.[1] Consequently, any condition that compromises skin integrity has profound implications for overall well-being, self-esteem, and social interaction.

Globally, skin diseases remain a major yet often under-recognised public health challenge. According to the Global Burden of Disease (GBD) 2019 study, skin and subcutaneous conditions collectively rank as the fourth leading cause of non-fatal disease burden worldwide, affecting over 1.9 billion people annually and accounting for nearly 43 million years lived with disability (YLDs).[2–4] The burden is particularly high in children and adolescents, where skin diseases consistently rank among the top five causes of disability.

The prevalence and diversity of skin diseases are shaped by a range of interrelated factors, including sex, age, occupation, seasonal variation, geographic location, socioeconomic status, and cultural practices.[5] In developing countries, prevalence ranges from 21 to 87%, while in high-income settings, skin conditions account for 7 to 15% of family practice consultations and 5% of all outpatient visits.[2, 6] In Tanzania, a 1998

rural survey reported a prevalence of 34.1%, dominated by tinea capitis (22.5%), scabies (21.2%), acne (19.2%), eczema (18.5%), and tinea corporis (18.5%).[6] However, these data are now over two decades old and may no longer reflect the current dermatological landscape, given urbanisation, lifestyle changes, and evolving healthcare access. A later study in Dar es Salaam schoolchildren (2010) revealed an even higher prevalence (57.3%), with infectious dermatoses predominating, particularly superficial fungal infections and pityriasis versicolour, while non-infectious disorders included acne vulgaris, non-specific ulcers, and atopic eczema.[7]

The impact of skin diseases extends beyond physical symptoms. Their effect on quality of life (QoL) varies by disease type. Even localised or asymptomatic lesions can impair well-being. [8] Conditions such as psoriasis, contact dermatitis, atopic dermatitis, urticaria, hair disorders, leprosy, scars, hyperhidrosis, and genital human papillomavirus have been shown to cause the greatest QoL impairment. [8] Multiple studies further reinforce the strong association between skin diseases and diminished QoL.[8, 9]

Understanding the spectrum and burden of skin diseases within specific populations is crucial for designing effective and context-appropriate interventions. Since dermatological disease distribution differs by region and population [13–16], local data are essential to guide health system planning. This study was therefore conducted to provide updated evidence on the prevalence, pattern, and quality of life impact of skin diseases among adults attending a tertiary dermatology clinic in Tanzania.

MATERIALS AND METHODS

Study Design and Setting

We conducted a hospital-based descriptive cross-sectional study at Muhimbili National Hospital (MNH), Dar es Salaam, Tanzania. The MNH is the country's largest tertiary referral and teaching hospital, serving urban and rural populations and receiving referrals from across Tanzania. The dermatology clinic operates twice weekly, staffed by seven consultant dermatologists, and attends to 50–80 outpatients per clinic day. The study was conducted between September 2021 and January 2022. The timeframe spanned both the dry season and the short rainy season, thus allowing assessment of seasonal influences on conditions such as eczema and papulosquamous disorders.

Study Population and Eligibility

Eligible participants were adults aged ≥18 years who attended the dermatology clinic during the study period. Inclusion criteria comprised a confirmed dermatological diagnosis made by a dermatologist and provision of written informed consent. Exclusion criteria included patients younger than 18 years, those with incomplete clinical records, critically ill patients unable to participate in interviews, and individuals who declined to provide consent.

Sample Size and Justification

All eligible adult patients attending the MNH dermatology clinic during the study period were consecutively enrolled, yielding 378 participants. Although no formal a priori calculation was performed, post-hoc power analysis confirmed adequacy. The required sample size for a chi-square test was justified using the formula:

$$N=(Z\alpha+Z\beta)2/\ w2$$

Where:

N = required sample size

Zα =Z-score corresponding to the significance level (α = 0.05, two-tailed → 1.96)

Zβ = Z-score corresponding to desired power (80% power → 0.84)

W = effect size (Cohen's w = 0.3 for moderate effect)

Stepwise: Zα+Zβ= 2.8, (2.8)2=7.84,7.84/0.09≈87 per group. With multiple outcome categories, the total sample of 378 participants provided >80% power to detect moderate effect sizes at α = 0.05.

Patient Recruitment

Participants were recruited at the entry point of the dermatology clinic, before formal consultation with a dermatologist. This ensured that socio-demographic and clinical histories were collected independently of the treating physician's influence

Pretesting of Research Tools

The structured questionnaire, including the DLQI, was pretested on 15 adult dermatology patients at MNH who were not part of the final study sample. It was translated into Swahili and back-translated into English by an independent translator to ensure accuracy and preserve meaning. Feedback from the pilot helped refine question clarity, sequence, and cultural appropriateness. The pretest confirmed that the tool was understandable, culturally appropriate, and feasible for the local clinic setting.

Diagnostic Criteria

Diagnoses were made on clinical grounds using standard dermatological criteria. Laboratory confirmation was performed when indicated and included potassium hydroxide (KOH) preparations for suspected superficial fungal infections, bacterial swabs and cultures for pustular or exudative lesions, and histopathology (biopsy) for suspected neoplasms, autoimmune blistering diseases, or Kaposi's sarcoma. This approach ensured that conditions with overlapping clinical features were objectively confirmed where necessary.

ICD-10 Classification

Skin diseases were classified according to the International Classification of Diseases, 10th Revision (ICD-10), with minor modifications to suit the local clinical context. The following ICD-10 categories were used: L20–L30: Dermatitis and eczema (including atopic, contact, and seborrhoeic dermatitis); L50–L54: Urticaria and erythematous conditions; L60–L75: Disorders of skin appendages (including acne, alopecia, and hyperhidrosis); L80–L99: Other disorders of the skin and subcutaneous tissue (including pigmentation disorders and scars); B35–B49: Mycoses (fungal infections); A30, A46, A63: Bacterial infections including leprosy, cellulitis, and genital warts; B00–B09, B97: Viral infections (herpes simplex, varicella, HPV); L40–L45: Papulosquamous

disorders (psoriasis, lichen planus); D23, D48, C43–C44, C46: Benign and malignant neoplasms (hypertrophic scars, skin cancers, Kaposi's sarcoma); B65–B83: Parasitic infestations (scabies, cutaneous larva migrans). Minor modifications included grouping eczema and urticaria together for analysis and pooling rarer diagnoses under 'miscellaneous.

Quality Control and Inter-rater Reliability

To ensure diagnostic consistency, all dermatologists adhered to a pre-standardised diagnostic protocol based on ICD-10. In routine practice, weekly departmental meetings were held to review complex or uncertain cases, and consensus diagnoses were made where needed. Although no formal inter-rater reliability (e.g., kappa) was calculated, these measures reduced variability across clinicians.

Bias Control

To minimize potential biases, several measures were implemented. Selection bias was addressed by enrolling all consecutive eligible patients. Information bias was reduced through the use of a structured, pre-tested questionnaire administered by trained research assistants. Misclassification bias was minimized by having evaluations conducted by consultant dermatologists, with laboratory confirmation where appropriate. Recall bias was mitigated by clarifying patient-reported information, such as family history and depression, in Swahili. To limit social desirability bias, interviews were conducted in private and confidentiality was strictly maintained.

Quality of Life Assessment

The Dermatology Life Quality Index (DLQI; licensed, ID CUQoL2970) was used in a validated Swahili translation. Translation involved forward translation by two bilingual clinicians, back-translation by an independent translator, expert review by dermatologists and linguists, and pilot testing with 15 dermatology patients at MNH. The pilot demonstrated good internal consistency (Cronbach's α = 0.82) and face validity, ensuring the Swahili version was both linguistically accurate and culturally appropriate for the Tanzanian population. The DLQI includes 10 items covering symptoms, feelings, household activities, clothing choice, social/leisure activities, sports, work/study, relationships, sexual life, and treatment burden. Each item is scored 0–3, giving a total of 0–30. Scores were categorized as: no effect (0–1), small effect (2–5), moderate effect (6–10), very large effect (11–20), and extremely large effect (21–30).

Variables

The dependent variable was the presence of dermatological conditions (e.g., eczema, psoriasis, viral warts, fungal infections, neoplasms). Independent variables included age, sex, education level, occupation, family history of skin disease, comorbidities (e.g., endocrine disorders, depression), occupational exposure, and seasonal variation.

Data Analysis

Data were analyzed using SPSS version 23 (IBM Corp., Armonk, NY, USA). Descriptive statistics summarized demographic and clinical characteristics. Associations between risk factors and disease categories were examined using chi-square tests and logistic regression, with results reported as odds ratios (OR) and 95% confidence intervals (CI). Analysis of variance (ANOVA) compared DLQI scores across disease groups. Given the exploratory nature of the study, findings are presented as associations rather than causal relationships.

Categorical variables were presented as proportions and continuous variables as medians with interquartile ranges (IQR) or means with standard deviations (SD). Associations between skin diseases and demographic/clinical variables were assessed using chi-square tests. For significant associations, odds ratios (OR) with 95% confidence intervals (CI) were reported to quantify the strength of associations.

Quality of Life (DLQI)

The Dermatology Life Quality Index scores were analysed both categorically (using standard cut-offs: no effect, small, moderate, very large, extremely large) and continuously (mean ± SD). Differences in mean DLQI scores across disease categories were further assessed using one-way analysis of variance (ANOVA), and multivariate linear regression was conducted to adjust for potential confounders (age, sex, education, comorbidities). Given the cross-sectional design, all results were interpreted as associations rather than causal relationships, and both statistical significance and clinical relevance were considered in interpretation. A p <.05 was considered statistically significant.

Ethical Considerations

Ethical approval was obtained from the Muhimbili University of Health and Allied Sciences Research Ethics Committee (MUHAS-REC-07-2021-738). Written informed consent was obtained from all participants. Patient confidentiality was protected by anonymising datasets, using study codes instead of personal identifiers, and password-protecting all electronic files. Interviews were conducted in private rooms, and only the minimum necessary personal data were collected.

RESULTS

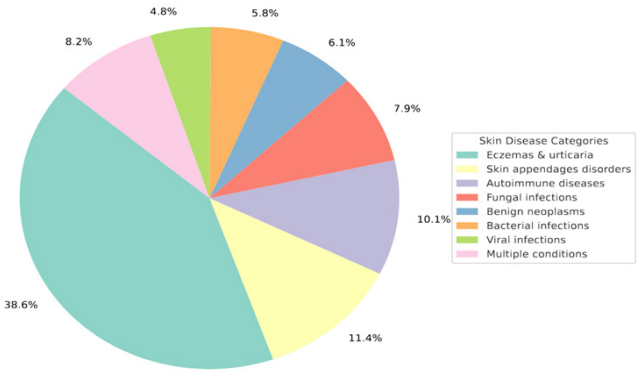
Pattern of Skin Diseases

Figure 1 shows the distribution of skin diseases among the 378 adult patients. The most common conditions were eczemas (dermatitis) and urticaria, present in 146 (38.6%) of patients. In this group, 112 (76.7%) had atopic dermatitis. Disorders of the skin appendages were the second most common, affecting 43 (11.4%), with acne vulgaris comprising 37 (86.0%). Autoimmune disorders ranked third, seen in 38 (10.1%) of patients, most commonly being systemic lupus erythematosus in 20 (52.6%).

Fungal infections were the fourth most frequent, affecting 30 (7.9%) participants, with pityriasis versicolour comprising 15 (50%) of them. This was followed by dermatophyte infections in 13 (43.3%). Benign neoplasms accounted for 23 (6.1%), predominantly the hypertrophic scars in 15 (65.2%). Bacterial infections occurred in 22 (5.8%), with scalp folliculitis in 7 (31.8%), impetigo in 6 (27.3%) and leprosy in 5 (22.7%). Viral infections were seen in 18 (4.8%), the majority being

genital warts, 17 (94.4%). In total, 31 (8.2%) of patients presented with more than one skin condition.

FIGURE 1: Pattern of Skin Diseases Among 378 Adult Patients at the Dermatology Clinic at MNH



Factors Associated with Skin Diseases

Table 1 shows the risk factors that showed a significant association with the occurrence of skin diseases. Eczematous dermatitis and urticaria were commoner among participants with a history of endocrine diseases ($p< .01$) and a family history of skin diseases ($P = .03$). Skin appendage disorders were most prevalent among participants younger than 35 years of age ($p<.01$) and among participants with university education ($p<.01$). Autoimmune disorders were more prevalent among the females ($p< .01$) and among those with a history of depression ($p < .01$). Papulosquamous disorders were more prevalent among participants aged 35 years or older ($p<.01$), with seasonal changes ($p=.01$) and university-level education ($p<.01$).

Quality of Life (DLQI Analysis)

Table 2 summarizes health-related quality-of-life (HRQoL) impairments across major skin disease categories. Overall, HRQoL was moderately affected (mean DLQI 9.69 ± 6.53), with comparable scores for females (8.56 ± 6.80) and males (8.86 ± 7.38).

Overall, 165 participants (43.7%) reported at least a moderate impact on quality of life (DLQI ≥10), with the majority experiencing very large to extremely large impairment. Of these, 112 (67.9%) had a very large effect (DLQI 11–20), 33 (20.0%) an extremely large effect (DLQI 21–30), and 20 (12.1%) a moderate effect (DLQI =10). Participants with eczematous and urticarial conditions, autoimmune disorders, benign neoplasms, bacterial infections, and parasitic infestations demonstrated the greatest HRQoL impairment, with mean DLQI scores in the moderate-to-severe range. Across all disease categories, the most affected DLQI domains were symptoms (itch, soreness, pain), work or school performance, and clothing choice.

TABLE 1: Risk Factors Significantly Associated with Skin Diseases Among Adults at MNH (N=378)

Risk Factor	Eczemas & Urticaria	Skin Appendage Disorders	Autoimmune Disorders	Papulo-squamous Disorders	Bacterial Infections	Viral Infections
Age (years)	–	Higher in <35yrs ($p<.01$)	–	Higher in ≥35yrs ($p<.01$)	–	–
Sex	–	–	↑ Females ($p<.01$)	–	↑ Males ($p=.04$)	↑ Males ($p<.01$)
Education	–	↑ University ($p<.01$)	–	↑ University ($p<.01$)	–	–
Depression	–	–	↑ Depression ($p<.01$)	–	–	–
Family History of Skin Disease	↑ ($p=.03$)	–	–	–	–	–
Endocrine Diseases	↑ ($p<.01$)	–	–	–	–	–
Seasonal Changes	–	–	–	↑ ($p=.01$)	–	–

Notes:
- "↑" indicates a higher prevalence in that subgroup.
- Only statistically significant associations ($p<.05$) are shown.
- non-significant associations omitted for clarity.

TABLE 2: Quality of life impairment across disease categories [N =378]

Disease Category	Proportion of participants with DLQI >10 (%)	Most Affected DLQI Domains
Eczema & Urticaria	71.3	Symptoms & feelings, Work/Study, Clothing
Skin Appendage Disorders	69.9	Symptoms & feelings, Leisure, Work/Study
Autoimmune Disorders	71.1	Symptoms & feelings, Work/Study, Clothing
Benign Neoplasms	73.9	Symptoms & feelings, Work/Study, Daily activities
Papulosquamous Disorders	68.8	Symptoms & feelings, Clothing, Work/Study
Pigmentation Disorders	57.1	Symptoms & feelings, Leisure, Daily activities
Malignant Neoplasms	50.0	Symptoms & feelings, Work/Study, Daily activities
Fungal Infections	66.6	Symptoms & feelings, Work/Study, Leisure
Bacterial Infections	68.2	Symptoms & feelings, Work/Study, Clothing
Viral Infections	61.2	Symptoms & feelings, Personal relationships, Work/Study
Parasitic Infestations	91.0	Symptoms & feelings, Daily activities, Work/Study
Miscellaneous	77.0	Symptoms & feelings, Work/Study, Clothing

DISCUSSION

This study described the pattern of skin diseases, associated factors, and their impact on quality of life (QoL) among adults attending the dermatology clinic at MNH. The most common skin conditions were eczema (dermatitis) and urticaria, followed by disorders of skin appendages, autoimmune disorders, fungal infections, benign neoplasms, bacterial infections, and viral infections. These findings are consistent with a previous Tanzanian study by Mastala and others, which also identified eczemas as the most prevalent dermatoses.[9] Similar patterns have been reported globally, where eczemas constitute the leading group of dermatological disorders.[11, 14–17] In the present study, atopic dermatitis accounted for the majority of eczema cases.

Skin problems were observed across all age groups, although some conditions were age-specific. Acne vulgaris, the leading appendage disorder, was most common among individuals aged 18 to 25 years, aligning with findings from Cairo, Egypt.[18] In contrast, papulosquamous disorders were more prevalent among older adults, echoing literature that psoriasis typically peaks at ages 20 to 30 and again at 50 to 60 years.[19]

Sex-related differences were evident. Autoimmune disorders occurred more frequently in females, likely due to higher genetic susceptibility from X-chromosome–linked mutations. [22, 23] In males, bacterial and viral infections, particularly genital warts, were more common. While HPV is often emphasized in women, international data show a high prevalence in men, with asymptomatic rates of up to 65%.[24] Among autoimmune diseases, systemic lupus erythematosus (SLE) was most frequent in females, reflecting the well-established 9:1 female-to-male incidence ratio.[25]

Genetic predisposition played an important role, with family history significantly associated with eczema/urticaria, reflecting the multifactorial aetiology of atopic dermatitis involving both genetic and environmental interactions.[26–28] Maternal inheritance has also been implicated in eczema risk.[29] In addition, a strong association between eczema and endocrine disorders was observed. Endocrinopathies, such as thyroid disease, have been linked with dermatological manifestations including atopic dermatitis.[30,31]

Comorbidities further influenced disease burden. Autoimmune skin conditions were more common among participants with depressive symptoms, a finding consistent with global statistics showing depression is twice as common in women, and particularly elevated in SLE populations.[32–35]

Quality of life was significantly affected, with 43.7% of participants reporting a large or extreme impact (DLQI >10). This finding is consistent with other African data, such as the Cape Town study by Jobanputra and others[36], which identified dermatitis as one of the most disabling dermatoses. In our study, the most impaired QoL domains were work/study performance, symptom burden, and clothing choice, highlighting that beyond physical symptoms, skin diseases interfere significantly with functional capacity and self-presentation.

From a clinical perspective, these findings highlight the importance of dermatology services going beyond symptom-based treatment. Routine use of QoL tools such as the DLQI could guide clinicians in triaging patients and prioritising those with higher impairment for more comprehensive management. This approach integrates pharmacological therapy with counseling, patient education, and, when appropriate, referral to mental health services.

Regional comparisons show that our findings align with reports from Egypt, Ethiopia, and Uganda, where eczema, acne, and fungal infections dominate outpatient dermatology visits.[10, 18, 20] Earlier Tanzanian data, however, painted a different picture: rural studies in 1998 reported tinea capitis and scabies as the most common dermatoses[6], while a 2010 Dar es Salaam school-based study found

infectious conditions to be predominant.[7] In contrast, our hospital-based cross-sectional study demonstrates a shift toward chronic non-infectious conditions, including eczema and autoimmune disorders, reflecting differing disease patterns between community and tertiary settings.

Temporal trends also suggest a transition in Tanzania from infectious to chronic inflammatory skin diseases over the past two decades. Earlier studies highlighted scabies and tinea as dominant conditions[6], but more recent tertiary hospital data[9], corroborated by our study, indicate eczema/dermatitis now predominate. This epidemiological shift likely reflects urbanisation, lifestyle change, and increased awareness leading to care-seeking at referral hospitals.

The high burden of chronic inflammatory skin conditions has significant healthcare resource implications. Unlike infectious dermatoses, these conditions often require long-term follow-up, sustained access to topical and systemic therapies, and psychosocial support. This calls for expanding dermatology services at primary and district levels to reduce referral pressure on tertiary centre such as MNH. Integration of dermatology with mental health, endocrinology, and infectious disease services is also warranted, given the identified associations with depression, endocrine disorders, and HIV. These findings further support the prioritisation of skin health within national non-communicable disease strategies and in healthcare financing policies such as insurance coverage.

Taken together, our findings underscore the importance of integrating quality-of-life (QoL) assessments into routine dermatology practice, strengthening regional dermatologic capacity, and promoting multidisciplinary collaboration in patient care. Addressing these gaps could substantially improve patient outcomes while reducing the broader societal burden of skin diseases in Tanzania and across East Africa.

This study has several strengths. The large sample size provides robust estimates of disease patterns in an East African tertiary dermatology clinic. The use of a validated health-related quality-of-life (HRQoL) instrument translated into Swahili enhances both cultural and linguistic relevance. Comprehensive disease categorisation using ICD-10 improves comparability with other studies, while specialist-driven diagnoses strengthen diagnostic accuracy. Moreover, the integration of clinical, psychosocial, and seasonal variables offers a multidimensional perspective on dermatologic disease burden. However, as a hospital-based study, the findings may not be generalisable to community settings, particularly rural populations. In addition, MNH is a tertiary referral hospital, and the case mix may over-represent severe, chronic, or complex dermatoses, further limiting generalisability. We also did not undertake extensive multivariable modelling beyond logistic regression and ANOVA, as the primary aim was descriptive. Residual confounding may therefore persist, and future studies employing predictive and longitudinal designs are warranted.

Our study has several clinical implications. The high prevalence of eczema and urticaria highlights the need for early diagnosis and standardised treatment protocols at the primary care level to reduce unnecessary tertiary referrals. The significant HRQoL impairment, particularly in domains of work ability, symptoms, and clothing choice, underscores the importance of integrating quality of life assessment (e.g., DLQI) into routine dermatology consultations. Additionally, the observed association between autoimmune skin diseases and depression suggests that dermatology services should incorporate basic mental health screening and referral pathways, as psychosocial burden is often under-recognised.

Furthermore, the identification of endocrine disorders being associated with skin diseases supports the need for a closer multidisciplinary collaboration between dermatologists, endocrinologists, and general physicians. Finally, the seasonal patterns of certain dermatoses highlight the need for anticipatory guidance and preventive strategies, such as targeted health education campaigns during high-risk seasons.

In conclusion, eczema and urticaria were the most common skin diseases among adults at MNH, with significant impairment of quality of life. Age, sex, depression, endocrine disorders, and seasonal variation were key associated factors. We therefore recommend the integration of routine health-related quality of life assessment in dermatology clinics to triage urgent vs. non-urgent cases. We further recommend larger community-based surveys for more representative data.

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