ма. Поэтому важным аспектом является не только правильная диагностика, но и понимание особенностей течения заболевания у различных групп пациентов.

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SKIN BARRIER ADAPTATION IN INTERNATIONAL STUDENTS: IRRITANT CONTACT DERMATITIS ASSOCIATED WITH CLIMATE TRANSITION AT GOMEL STATE MEDICAL UNIVERSITY

Introduction

The rising prevalence of skin barrier dysfunction is an issue of particular relevance for populations undergoing significant environmental transitions, including international students relocating to regions with climates markedly different from their place of origin. The stratum corneum, the outermost layer of the skin, is essential for maintaining cutaneous health by supporting barrier integrity, regulating microbial diversity, and modulating immune responses. However, exposure to environmental stressors such as temperature fluctuations, changes in humidity, and elevated levels of air pollution may compromise these protective functions [1]. Under consistent climatic conditions, the skin adjusts progressively to seasonal changes. However, an abrupt shift between distinct climate zones for instance, relocating from a tropical, arid, or temperate environment to the continental climate of Belarus can surpass the skin's adaptive capacity. This may result in heightened vulnerability to irritant contact dermatitis and other dermatological conditions [2].

In this context, international students constitute a particularly vulnerable group, as they must manage physiological adaptation to a new environment alongside academic, linguistic, and sociocultural pressures. Evidence indicates that environmental transitions can provoke cutaneous reactions through several mechanisms. Exposure to cold, dry air may compromise the integrity of the stratum corneum by depleting natural moisturising factors and disrupting the organisation of the lipid bilayer. Fluctuations in temperature can trigger neurogenic inflammation and vasomotor instability. Furthermore, the use of indoor heating during winter months may exacerbate transepidermal water loss [3].

Irritant contact dermatitis results from direct, non-immunological injury to keratinocytes caused by physical or chemical agents. Unlike its allergic counterpart, it does not require prior sensitisation and can develop within minutes to hours following exposure [4] Unlike atopic dermatitis, which is shaped by complex genetic and immunological factors, irritant contact

dermatitis can affect nearly anyone exposed to sufficient barrier-disrupting conditions. This makes it a particularly useful model for investigating climate-related skin stress in previously healthy populations. The condition typically presents with itching, stinging, erythema, and dryness, most commonly on exposed areas such as the hands and face, which are frequently subjected to environmental elements during daily activities [4].

While the impact of climate on skin health is increasingly acknowledged, few studies have specifically explored skin barrier adaptation in international medical students undergoing rapid climate transitions [5, 6].

Goal

The objective of this study was to examine skin barrier adaptation and the prevalence of irritant contact dermatitis symptoms among international students at Gomel State Medical University following a climate transition. A survey-based analysis was conducted with 188 respondents to explore associations between demographic characteristics, pre-existing skin conditions, environmental exposures, and dermatological outcomes. The findings aim to clarify the clinical significance of climate-related skin barrier disruption in this vulnerable population.

Material and methods of research

This study was based on survey data collected from 188 international students at Gomel State Medical University. Participants completed a structured online questionnaire assessing skin barrier adaptation and symptoms of irritant contact dermatitis following their transition to the climate of Belarus.

The questionnaire captured demographic details – including age, gender, and climate of origin alongside clinical history such as pre-existing skin conditions and prior diagnoses. Dermatological outcomes were recorded in terms of symptom type, location, onset, and seasonal variation.

The results of the research and their discussion

This analysis examines differences in skin barrier adaptation based on climate of origin and symptom presentation among international students at Gomel State Medical University, using data summarised in tables 1 and 2.

Respondents were grouped according to their home climate classification and reported skin changes following arrival in Gomel (Table 1). The largest proportion of students originated from Tropical climates (61 students, 32.4%), followed by Arid/Desert (53 students, 28.2%), Temperate (42 students, 22.3%), Continental (24 students, 12.8%), and Cold/Polar regions (8 students, 4.3%). Overall, 142 students (75.5%) reported that their skin had become more sensitive or reactive since relocation. This was most frequently observed among those from Tropical climates (51 of 61 students, 83.6%) and Arid/Desert climates (42 of 53 students, 79.2%). These results suggest that students transitioning from warm, humid or hot, dry environments to the continental climate of Gomel experience the most substantial skin barrier disruption.

Table 1 – Skin Changes According to Climate of Origin (N=188)

Skin Change Category	Number of Students (n)	Percentage (%)
More sensitive/reactive	140	74.5
Slightly drier / Much drier	30	15.9
No change / Oiler	18	9.6

The data in table 1 illustrate distinct associations between climate of origin and post-migration skin adaptation. Students from Tropical climates exhibited the highest frequency of increased skin sensitivity (83.6%), likely reflecting the most pronounced contrast between home and host environments. Those from Arid/Desert climates also reported elevated rates (79.2%), suggesting

that prior adaptation to dry conditions does not fully mitigate the combined effects of cold and wind exposure in Gomel. Students originating from Temperate, Continental, and Cold/Polar climates reported progressively lower, yet still considerable, rates of increased sensitivity, indicating that skin barrier disruption affects a majority of international students across all climate categories.

Comparative data on symptom presentation and healthcare-seeking behaviour are presented below (table 2).

Table 2 – Symptom Patterns and Healthcare Consultation (N=188)

Seasonal Pattern	n=188	Percentage (%)
Worse during spring (windy)	81	43.1
Worse during cold/dry winter	52	27.7
Constant throughout the year	22	11.7
Worse during summer	33	17.6

As shown in table 2, persistent dryness and flaking was the most frequently reported bothersome symptom (54 students, 28.7%), followed by redness and inflammation (46 students, 24.5%). Students who experienced cracking or fissures had the highest rate of medical consultation (72.4%), indicating that this symptom may be perceived as particularly severe or concerning. Among those reporting no symptoms, only 16.7% sought medical attention, a finding consistent with expected healthcare-seeking patterns in asymptomatic individuals.

These findings highlight the substantial burden of climate-related skin symptoms within this international student cohort and reveal variation in healthcare utilisation depending on symptom type. Students presenting with more physically disruptive manifestations–such as fissures and persistent dryness–were more inclined to seek professional medical advice.

Conclusion

The findings of this study indicate a high prevalence of climate-related skin barrier disruption among international students. The majority of respondents (75.5%) reported increased skin sensitivity following their arrival in Gomel, with the highest rates observed among those from Tropical (83.6%) and Arid/Desert climates (79.2%). Persistent dryness and flaking was the most commonly reported bothersome symptom (28.7%), while the presence of cracking or fissures was associated with the highest rate of medical consultation (72.4%). These patterns suggest that impaired skin barrier adaptation represents a significant, yet underrecognised, health concern with potential implications for academic performance and quality of life.

These results support the inclusion of comprehensive dermatological guidance in pre-arrival and orientation materials for international students. Targeted education – taking into account climate of origin and individual risk factors – may facilitate early identification of vulnerable individuals, particularly those transitioning from warm, humid or hot, dry environments to continental climates.

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