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“Comparison of Skin Characteristics Between Korean and Vietnamese Women: Focusing on Age-Related Differences Between the 20s and 50s”

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1. Introduction

Skin characteristics are influenced by a complex interplay of intrinsic and extrinsic factors that contribute to significant variations across different populations. Intrinsic factors such as age and genetic background fundamentally shape the physiological structures and functions of the skin, while extrinsic factors including climate, lifestyle habits, and skincare routines further modify these characteristics over time [1]. Understanding these variations is essential for advancing dermatological knowledge and developing targeted skincare solutions that address specific needs. Korea and Vietnam present particularly interesting comparative contexts due to their geographic proximity within Asia yet distinctive environmental conditions, cultural practices, and genetic backgrounds that potentially influence skin parameters such as hydration, sebum production, and pigmentation [2,3].

This study focuses specifically on comparing skin characteristics between Korean and Vietnamese women in two distinct age groups: those in their 20s and those in their 50s. The selection of these populations enables examination of both ethnicity-related differences and age-related changes within each ethnic group. By employing non-invasive biophysical methods to precisely assess parameters such as skin hydration, sebum content, elasticity, and pigmentation, we can quantitatively evaluate differences that may be attributable to genetic predisposition, environmental factors, and lifestyle practices [4]. The clinical significance of this research lies in its potential to inform the development of ethnicity- and age-specific skincare formulations and dermatological treatments that address the unique requirements of these populations [5]. Understanding these differences represents a crucial step toward advancing personalized approaches to skincare that are tailored to individual skin characteristics.

Despite growing interest in ethnic variations in skin properties, comparative studies specifically examining differences between Korean and Vietnamese women remain scarce in the literature, particularly those that simultaneously address age-related changes. This research addresses this gap by investigating age-related changes and providing detailed data on skin parameter variations between Korean and Vietnamese women, specifically focusing on two critical life stages (20s and 50s). The findings will contribute to a more comprehensive understanding of skin diversity within Asia and support the development of evidence-based, culturally

appropriate skincare recommendations and dermatological interventions tailored to the unique needs of these populations.

2. Materials and Methods

2.1. Subjects

This cross-sectional skin characteristics study was conducted from December 2024 to January 2025. A total of 72 healthy adult female subjects were recruited, comprising 46 Korean women (22 in their 20s and 24 in their 50s) and 26 Vietnamese women (12 in their 20s and 14 in their 50s) (Table 1). All participants had no underlying skin diseases and were included in the final analysis. Participants with a history of systemic steroid or retinoid treatments within 6 months, topical steroid use for over a month, or cosmetic procedures (including botulinum toxin, fillers, dermabrasion, etc.) within 6 months were excluded from the study.

Table 1. Age information of subjects

Country	Gender	Age groups	N	Mean age (Mean±SD)
Korean	Female	20s	22	24.45±2.91
		50s	24	53.42±2.62
Vietnamese	Female	20s	12	24.67±5.37
		50s	14	54.00±3.55

SD, standard deviation.

2.2. Ethical Considerations

The study protocol was approved by the Institutional Review Board of Intertek Testing Services Korea (Approval Number: Intertek IRB-202412-HR(1)-0001). All procedures were performed in accordance with the 1975 Declaration of Helsinki and its later amendments. Written informed consent was obtained from all participants prior to enrollment in the study.

2.3. Measurement Conditions

All measurements were conducted under strictly controlled environmental conditions to ensure the consistency and reliability of the results. Subjects washed their faces with a standardized cleanser provided by the research team and then remained quietly in a temperature- and humidity-controlled room (22 ± 2°C, 50 ± 10% relative humidity) for 30 minutes of acclimatization before any measurements were taken. This standardized approach ensured that all subjects were evaluated under identical conditions.

2.4. Biophysical Parameters and Instrumentation

The following biophysical parameters were measured using validated instruments (Table 2).

Table 2. Biophysical parameters with their respective measurement devices and sites

Parameter	Device	Unit	Measurement site
Skin lightness	Spectrophotometer CM-26d (Konica Minolta, Japan)	L* value	Cheek
Sebum content	Sebumeter SM810 (Courage+Khazaka, Germany)	µg/cm²	Nose
Pore total volume	ANTERA 3D CS (miravex, Ireland)	mm³	Cheek
Skin hydration	Corneometer CM825 (Courage+Khazaka, Germany)	A.U.	Cheek

TEWL	Tewameter TM300 (Courage+Khazaka, Germany)	g/m ² /h	Cheek
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TEWL, Transepidermal water loss; A.U., arbitrary units.

2.5. Statistical Analysis

Data were expressed as mean \pm standard deviation (SD). The normality of the data was assessed using the Shapiro-Wilk test. For normally distributed variables, an independent t-test was performed to evaluate differences between the two groups. For non-normally distributed variables, the Mann-Whitney U test was employed as a non-parametric alternative. A p-value of <0.05 was considered statistically significant. All statistical analyses were performed using SPSS Statistics 26 Standard (IBM, USA).

3. Results

3.1. Skin Lightness

Analysis of skin lightness (L^* values) revealed significant differences both between ethnicities and age groups ($p < 0.05$). Korean women exhibited overall higher lightness values compared to their Vietnamese counterparts. Korean women in their 20s demonstrated the highest skin lightness values (65.68 ± 3.04), followed by Korean women in their 50s (62.57 ± 3.29). Vietnamese women showed comparatively lower values, with 61.91 ± 2.12 in the 20s group and 58.69 ± 2.61 in the 50s group. Both ethnic groups demonstrated a statistically significant decline in skin lightness with advancing age (Table 3, Figure 1).

Table 3. Skin lightness, sebum content, pore analysis, skin hydration, and transepidermal water loss of the subjects

Variable	Age	Korean (n=46)	Vietnamese (n=26)	p-value
		Mean \pm SD	Mean \pm SD	
Skin lightness (L^*)	20s	65.68 \pm 3.04	61.91 \pm 2.12	.001*
	50s	62.57 \pm 3.29	58.69 \pm 2.61	.001*
Sebum content ($\mu\text{g}/\text{cm}^2$)	20s	115.66 \pm 68.97	65.00 \pm 22.99	.004*
	50s	40.79 \pm 23.87	64.36 \pm 36.65	.021*
Pore total volume (mm^3)	20s	0.23 \pm 0.19	0.24 \pm 0.14	.000*
	50s	0.83 \pm 0.55	1.59 \pm 0.54	
Skin hydration (A.U.)	20s	75.97 \pm 8.82	75.14 \pm 6.01	
	50s	72.24 \pm 10.13	73.15 \pm 7.66	
TEWL ($\text{g}/\text{m}^2/\text{h}$)	20s	19.94 \pm 6.77	18.20 \pm 3.94	
	50s	17.33 \pm 3.96	18.26 \pm 3.15	

* $p < 0.05$

SD, standard deviation; TEWL, Transepidermal water loss; A.U., arbitrary units.

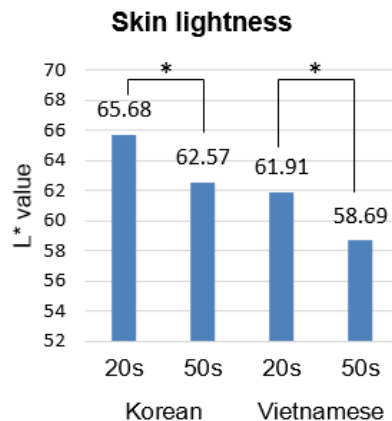


Figure 1. Comparison of skin lightness changes between Koreans and Vietnamese in their 20s and 50s. * $p < 0.05$.

3.2. Sebum Content

Sebum production patterns revealed notable differences between the ethnic groups, particularly in age-related changes. Korean women showed a dramatic decline in sebum content with age, from 115.66 ± 68.97 in their 20s to 40.79 ± 23.87 in their 50s, representing an approximately 65% reduction. In contrast, Vietnamese women maintained relatively stable sebum levels across age groups, with 65.00 ± 22.99 in their 20s and 64.36 ± 36.65 in their 50s. Young Korean women exhibited substantially higher sebum production compared to their Vietnamese counterparts, while this trend reversed in the older age groups, with Vietnamese women in their 50s showing higher sebum content than Korean women of the same age (Table 3, Figure 2).

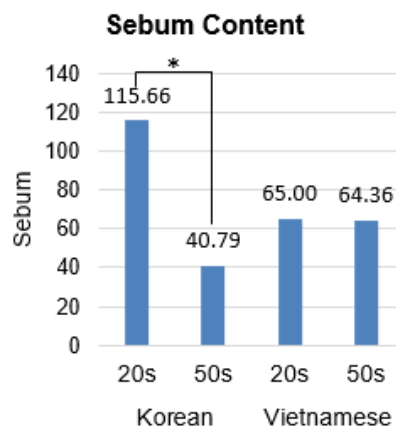
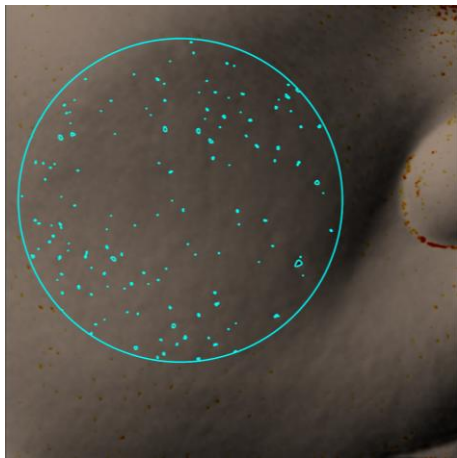


Figure 2. Comparison of sebum content changes between Koreans and Vietnamese in their 20s and 50s. * $p < 0.05$.

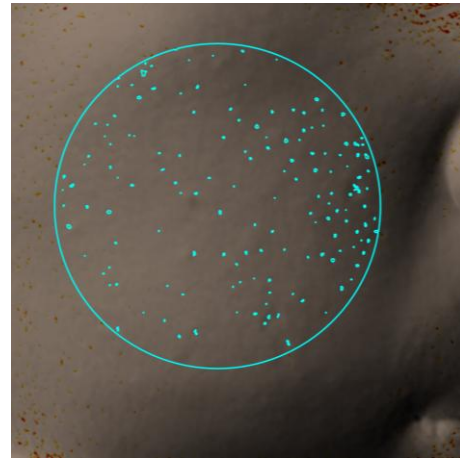
3.3. Pore Total Volume

Pore total volume measurements revealed significant age-related changes in both ethnicities, with more pronounced effects observed in Vietnamese women. In the 20s age group, both ethnicities showed similar pore volumes (Korean: 0.23 ± 0.19 ; Vietnamese: 0.24 ± 0.14). However, substantial increases were observed in the 50s groups, with Korean women showing an increase to 0.83 ± 0.55 and Vietnamese women exhibiting a more dramatic increase to 1.59 ± 0.54 . Statistical analysis confirmed that these age-related increases were significant for both groups ($p < 0.05$). These findings suggest that age-related changes in pore characteristics are considerably more pronounced in Vietnamese women compared to Korean women, with

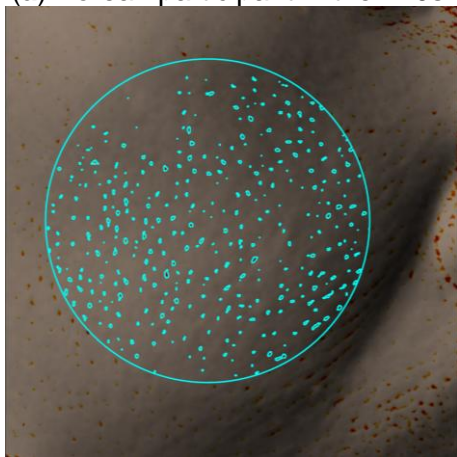
the difference between ethnic groups becoming more apparent with advancing age (Table 3, Figure 3).



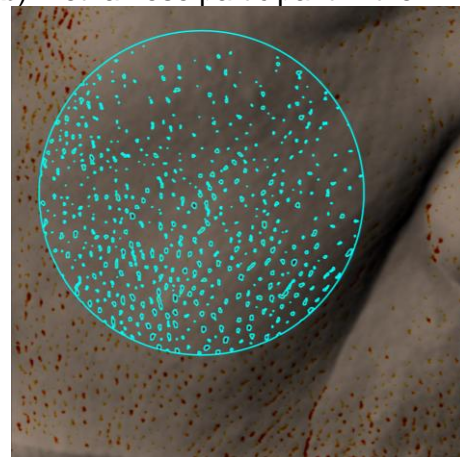
(a) Korean participant in their 20s.



(b) Vietnamese participant in their 20s



(c) Korean participant in their 50s



(d) Vietnamese participant in their 50s

Figure 3. Representative images of pore analysis for each ethnic and age group, selected based on pore total volumes approximating the mean values of the respective groups: (a) The mean pore total volume for Korean participants in their 20s is 0.23 mm^3 , showing a pore total volume of 0.21 mm^3 in this image; (b) The mean pore total volume for Vietnamese participants in their 20s is 0.24 mm^3 , showing a pore total volume of 0.22 mm^3 in this image; (c) The mean pore total volume for Korean participants in their 50s is 0.83 mm^3 , showing a pore total volume of 0.77 mm^3 in this image; (d) The mean pore total volume for Vietnamese participants in their 50s is 1.59 mm^3 , showing a pore total volume of 1.45 mm^3 in this image.

3.4. Skin Hydration

Skin hydration levels remained relatively consistent across both ethnicities and age groups. Korean women in their 20s exhibited hydration values of 75.97 ± 8.82 , while their Vietnamese counterparts showed values of 75.14 ± 6.01 , with no statistically significant difference between groups ($p > 0.05$). Both ethnic groups demonstrated a modest age-related decline in hydration, with values decreasing to 72.24 ± 10.13 and 73.15 ± 7.66 for Korean and Vietnamese women in their 50s, respectively (Table 3).

3.5. Transepidermal Water Loss (TEWL)

TEWL values exhibited minor variations across groups and age ranges. Korean women showed a decrease in TEWL with age, from 19.94 ± 6.77 in their 20s to 17.33 ± 3.96 in their 50s. In contrast, Vietnamese women maintained stable TEWL levels, with values of 18.20 ± 3.94 in their 20s and 18.26 ± 3.15 in their 50s. Notably, TEWL values in the 50s age group were nearly identical between Korean (18.20 ± 3.94) and Vietnamese women (18.26 ± 3.15) (Table 3).

4. Discussion

The observed differences in skin characteristics between Korean and Vietnamese women could be influenced by a complex interplay of genetic, environmental, and lifestyle factors. This study addresses a significant gap in dermatological literature by providing detailed comparative data while simultaneously examining age-related changes in these understudied populations. Our preliminary findings from 72 participants (46 Korean and 26 Vietnamese women) reveal important nuances in how ethnicity influences the aging process of skin, challenging more generalized approaches to Asian skin care.

The consistently higher skin lightness values in Korean women across both age groups suggest fundamental genetic differences in melanin production and distribution. These findings align with previous research, which documented distinct skin color characteristics among East and Southeast Asian populations [2]. The genetic basis for these differences may involve variations in tyrosinase activity and melanocyte function, which determine constitutive pigmentation levels.

One of our most striking findings involves the dramatic differences in sebum production patterns between ethnicities. Korean women exhibited substantially higher sebum levels in their 20s but experienced a sharp decline by their 50s, while Vietnamese women maintained consistent levels across age groups. This pattern suggests potential differences in hormonal regulation of sebaceous glands between these populations. Previous research has documented ethnic variations in sebaceous lipid composition and secretion [6], though these findings do not specifically pertain to the Korean and Vietnamese populations. Environmental factors may also contribute to these differences, as Vietnam's tropical climate may necessitate more consistent sebum production for skin barrier maintenance compared to Korea's more temperate conditions.

The more pronounced age-related increases in pore total volume observed in Vietnamese women suggest potential differences in skin aging patterns between the studied groups. The notable increase from 0.24 ± 0.14 in their 20s to 1.59 ± 0.54 in their 50s (compared to Korean women's increase from 0.23 ± 0.19 to 0.83 ± 0.55) may reflect multiple influencing factors. While biological differences in dermal matrix maintenance could play a role, long-term environmental exposures, climate conditions, and lifestyle habits could significantly contribute to these observations. These findings highlight the importance of considering both biological and environmental factors when studying skin aging across different populations, which may inform more personalized skincare approaches.

In contrast, the relative stability in skin hydration and TEWL values across both ethnicities suggests that certain barrier function parameters may be less susceptible to ethnic variation than parameters related to pigmentation, sebum production, and structural integrity.

The quantitative biophysical assessment of multiple parameters provides a comprehensive profile of skin characteristics that advances beyond the more simplistic categorizations often applied to Asian skin types. Such detailed characterization is essential for developing truly personalized skincare approaches that address the specific needs of different populations [5]. Our research contributes to securing more accurate data and understanding skin diversity in

Asia, which remains underrepresented in dermatological literature despite the region's large and diverse population.

There are some limitations to our current analysis. The sample size imbalance between groups may influence statistical comparisons. Additionally, while our study examines women in their 20s and 50s to capture distinct life stages, it does not provide data on the continuous progression of skin changes across the lifespan. The study is currently underway with a targeted total of 200 participants (50 per group), and this poster presentation represents preliminary findings from the first 72 participants.

Future research would benefit from larger sample sizes, longitudinal designs, and more detailed characterization of lifestyle factors that may influence skin parameters.

5. Conclusion

This study aimed to analyze skin characteristics of Vietnamese and Korean women in their 20s and 50s, focusing on racial and age-related differences. Our comprehensive investigation revealed significant variations in multiple skin parameters between these populations. Korean women demonstrated higher skin lightness values in both age groups compared to Vietnamese women, with both ethnicities showing significant age-related decline in L^* values. One of the most striking ethnic variations was observed in sebum production patterns - Korean women exhibited a dramatic decline (approximately 65%) in sebum content with aging, while Vietnamese women maintained relatively stable sebum levels across age groups. Analysis of pore characteristics revealed similar total volume measurements between ethnicities in the 20s age group, but Vietnamese women in their 50s displayed substantially larger age-related increases compared to their Korean counterparts. Interestingly, skin hydration remained relatively consistent across ethnicities and showed only modest age-related declines in both groups. Transepidermal water loss (TEWL) values displayed minor variations, with Korean women showing a decrease with age while Vietnamese women maintained stable levels.

This comparative analysis highlights significant ethnicity- and age-related differences that have important implications for dermatological research and clinical practice. The distinct patterns observed in skin lightness, sebum production, pore characteristics, hydration, and TEWL underscore the importance of considering both ethnic background and age when evaluating skin properties and developing skincare recommendations.

As this research continues to expand with additional participants, it will provide increasingly robust evidence to inform the development of personalized skincare solutions and dermatological interventions tailored to the specific needs of these populations. The knowledge gained through this and future studies will enhance our understanding of skin diversity within Asia and support more effective, evidence-based approaches to dermatological care for these understudied populations.

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