

Skin Care and Colour Cosmetics in Patients with Sensitive Skin

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ABSTRACT

Objective: Sensitive skin is a dermatological condition that is frequently observed and causes discomfort in individuals. Therefore, individuals with sensitive skin must carefully choose skin care and makeup habits. Our aims in this study were to conduct the first sensitive skin prevalence study in Turkey and to identify skin care and makeup habits.

Methods: An online prospective controlled survey study was conducted among 1037 women. Participants with and without sensitive skin aged >18 years were included in the 3-month study.

Results: Of the participating women, 82.73% were found to have sensitive skin. The most sensitive part of the face was the cheek ($p < 0.001$). Therefore, blush was the least frequently used by individuals with sensitive skin ($p = 0.008$).

Conclusion: Sensitive skin is an important social and medical problem. The skin care and makeup habits of individuals with sensitive skin should be examined in detail and more help should be provided by dermatologists to these individuals.

Keywords: colour cosmetics, sensitive skin, skin care, skin barrier

1. INTRODUCTION

Symptomatic sensory findings such as burning, stinging, tightness, tingling, pain, and itching of the skin are defined as “sensitive skin” (1). These findings can be triggered by physical, thermal, or chemical stimuli that do not cause discomfort in normal healthy skin (2). Sensitive skin is a frequently observed and, therefore, important social problem. In the study of Misery et al., the European prevalence of sensitive skin was 38% (3), which increased to 70–80% in women when evaluated on the basis of their self-reported observations but was slightly lower (50–60%) in men (4).

Prevalence studies on sensitive skin have been conducted in many countries. In previous survey studies, participants described themselves as having “sensitive skin.” While the prevalence rates of sensitive skin in European countries (3), the United States (5), Russia, and Brazil (6) are approximately 40%, similar rates were observed in Japan (7), whereas lower rates were found in China (8). Prevalence studies were conducted in various geographical locations, both sexes (9), and different age groups (10), comorbid facial skin diseases (11), hormonal changes (12), anatomical regions (genital, scalp, and cornea) (13-16), and triggering factors (4).

A survey study by a special interest group of the International Forum for the Study of Itch has clarified that triggering factors of sensitive skin, along with environmental factors (hot and cold weather, temperature changes, and sun exposure), include emotional stress and cosmetic and skin care products (17). Before “sensitive skin” was defined, Maibach defined similar clinical findings as cosmetic intolerance syndrome (18). Therefore, cosmetics and skin care products have been frequently examined as trigger factors of sensitive skin (19-21). Nevertheless, previous studies showed that participants were never questioned about which cosmetic products caused more discomfort and how they used skin care products and sunscreen.

While data from many countries on the prevalence of sensitive skin are available, no data have been obtained from studies in Turkey. Thus, our aim in this study was to investigate the prevalence of sensitive skin in Turkey and evaluate the cosmetic and skin care product and sunscreen use habits of participants with sensitive skin.

2. METHODS

2.1. Study participants

This is a nationwide online prospective survey study among 1037 women aged >18 years that was conducted from July 2020 through September 2020 using the Google Forms platform through WhatsApp, e-mail, and social media. Participants who had neither facial dermatological disease, atopy, and allergy nor a familial history of atopy, allergy, and sensitive skin were excluded from the study. Participants were selected using the quota method (age and region). All the participants provided information through the online survey and permitted the use of this information in the study. Ethics committee approval was obtained from the University of Health Sciences Istanbul Training and Research Hospital Scientific Research and Publication Ethics Board (diary number: 2485, date: July 24, 2020).

2.2. Questionnaire

The questionnaire used in the study consisted of three parts. The first section collected demographic and clinical data. Section 2 was on skin care and makeup habits. The questionnaire was designed using the hybrid method (open-ended and multiple-choice questions). First, the participants were divided into the sensitive (slightly, moderate, and very) and non-sensitive skin groups based on self-assessments. Then, the first part of the questionnaire included age, place of residence (rural, urban, and metropole), marital status (single and married), Fitzpatrick skin type, and skin type (oily, dry, normal, and combination), in this order.

The second part of the questionnaire included the following: frequency of face washing (never, every day, 2 or 3 days/week, and 2 or 3 days/month), types of facial cleansing products used (open-label question), frequency of makeup use (never, every day, 2 or 3 days/week, and 2 or 3 days/month), frequency of cleansing face to remove makeup (never, and always), makeup products that can be used without causing skin sensitization on the face (foundation, blush, lipstick, eyeliner, mascara, perfume, and powder), frequency of using sunscreens and sunscreen cleansers (for both: never, every day, 2 or 3 days/week, and 2 or 3 days/month).

The third part consisted of questions on sensitivity localizations on the face (cheeks, forehead, nasolabial grooves, eyelids, chin, upper lip, and upper nose), duration of skin sensitization on the face (open-label question), course of skin sensitization on the face (episodic or constant), triggering factors of skin sensitization on the face (exposure to water, cold weather, hot weather, dry weather, temperature changes, air conditioning, air pollution, and the sun; consumption of spicy foods, coffee, tea, alcohol, and smoking; and emotional stress), seasons that trigger skin sensitization, rashes and scaling on the face with sensitization, and any visit to the dermatologist for skin sensitization within 1 year (dichotomous question).

2.3. Statistical analysis

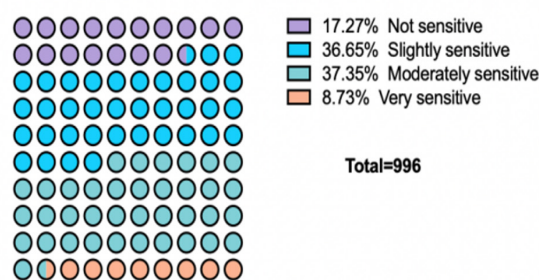
The SPSS 22.0 program for Windows was used for the statistical analysis. The descriptive statistics used included the numbers and percentages of categorical variables and numerical variables expressed as mean, standard deviation, minimum, maximum, and median values. The rates in the independent groups were compared using the chi-square test. The numerical variables had an abnormal distribution, so more than two groups were compared using the Kruskal-Wallis test. Subgroup analyses were performed with the Mann-Whitney *U* test and interpreted with Bonferroni correction. A *p*-value < 0.05 was considered statistically significant.

3. RESULTS

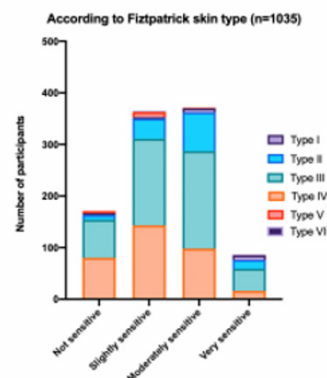
3.1. Demographic and Clinical Data

The mean age was 31.3 ± 11.6 years (range, 18–68 years) in the sensitive skin groups and 35.2 ± 11.2 years (range, 18–66) in the non-sensitive skin groups (*p* = 0.522). The distribution of the participants according to skin sensitivity is shown in Fig. 1a. The duration of skin sensitization on the face was 5.3 ± 2.9 years in the sensitive skin groups. Moreover, the discomfort felt on the faces of those who were “very sensitive” were longer-lasting than those in the other groups (*p* < 0.001). Sensitivity according to the Fitzpatrick skin type, and normal, combination, dry, and oily skin types are presented in Fig. 1b and 1c.

Self reported sensitive skin groups



B



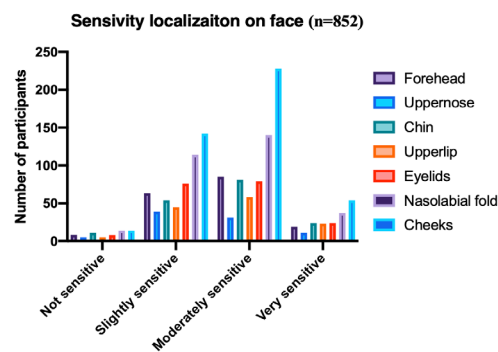
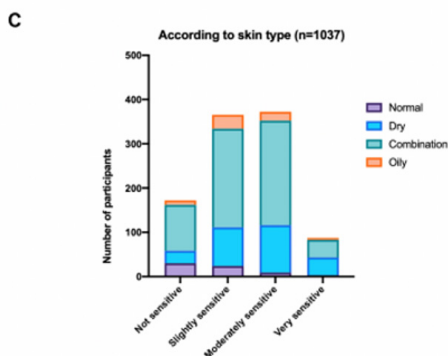


Figure 1. Self-reported sensitive groups. Distribution of participants according to sensitivity (A). Of 172 (17.3%) participants are reported that not sensitive; 365(36.6%) slightly sensitive, 372(37.3%) moderately sensitive and 87(8.7%) very sensitive. Sensitivity according to Fitzpatrick skin type, and normal, combination, dry and oily skin (B and C) Those with Fitzpatrick skin type 1-2, combination skin and dry skin were significantly higher in moderately sensitive and very sensitive skin groups ($p < 0.001$ for both) but Fitzpatrick skin type 4-5, normal skin and oily skin were significantly higher in slightly sensitive and not sensitive skin groups ($p < 0.001$ for both).

Figure 2. Sensitivity localization on face (n=852)

The chin ($p = 0.030$), upper lip ($p = 0.006$), and cheeks ($p < 0.001$) in the “very sensitive skin” group were more sensitive than the forehead ($p = 0.216$), upper nose ($p = 0.754$), eyelids ($p = 0.274$), and nasolabial folds ($p = 0.060$; Fig. 2). Only 12.4% of the participants in the group used topical facial cream, but most of them had very sensitive skin ($p < 0.001$). Antibiotic ($p = 0.001$), immunomodulation ($p = 0.023$), corticosteroid ($p < 0.001$), and hydroquinone creams ($p = 0.007$) were significantly more frequently used than acne creams in the “very sensitive skin” group ($p = 0.362$).

3.2. Skin Care and Makeup Habits

No statistically significant differences in the frequency of face washing ($p = 0.055$) and types of cleansing products (cleansing gel, soap, cleansing makeup remover wet wipes, and makeup cleansing oil and micellar water). Furthermore, the participants who were “not sensitive” and “slightly sensitive” frequently applied makeup every day ($p = 0.015$), and those who were “moderately sensitive” and “very sensitive” used blush significantly less frequently ($p = 0.008$). Most (67.1%) of the participants reported “definitely removing makeup,” but no significant differences were found between the sensitive skin groups ($p = 0.799$). Daily use of sunscreen was more frequent among the “very sensitive” individuals than among the other groups ($p = 0.043$). Of our participants, 616 (60.6%) did not use a sunscreen facial cleanser. We found no significant differences between the sensitive skin groups ($p = 0.367$; Table 1).

Table 1. Makeup habits of patients according to severity of sensitive skin

	Total n (%)	Not Sensitive n (%)	Slightly Sensitive n (%)	Moderately Sensitive n (%)	Very Sensitive n (%)	p value
Frequency of doing makeup (n=1036)						
2-3 days/month	225(21.7)	33(19.2)	86(23.6)	80(21.5)	19(21.8)	0.015
2-3 days / week	323(31.2)	54(31.4)	105(28.8)	122(32.8)	27(31.0)	
Everyday	275(26.5)	60(34.9)	106(29.1)	78(21.0)	19(21.8)	
None	84(8.1)	11(6.4)	21(5.8)	37(9.9)	12(13.8)	
2-3 days /year	129(12.5)	14(8.1)	46(17.6)	55(14.8)	10(11.5)	
Cleaning of makeup (n=1002)						
Sometimes I clean, sometimes I don't	303(30.2)	48(28.7)	112(31.2)	108(30.3)	22(26.8)	0.799
Definitely clean	670(66.9)	112(67.1)	239(66.6)	238(66.9)	56(68.3)	
Never clean	29(2.9)	7(4.2)	8(2.2)	10(2.8)	4(4.9)	
Used Makeup products (n=1037)						
Foundation	336(32.4)	59(34.3)	122(33.4)	114(30.6)	28(32.2)	0.805
Blush	346(33.4)	73(42.4)	127(34.8)	108(29.0)	23(26.4)	0.008
Lipstick	541(52.2)	89(51.7)	191(52.3)	196(52.7)	43(49.4)	0.957
Eyeliner	567(54.7)	106(61.6)	194(53.2)	191(51.3)	49(56.3)	0.147
Mascara	647(62.4)	101(58.7)	241(66.0)	217(58.3)	56(64.4)	0.134
Parfume	602(58.1)	104(60.5)	214(58.6)	215(57.8)	46(52.9)	0.699
Powder	76(7.3)	12(7.0)	31(8.5)	22(5.9)	8(9.2)	0.512
Use of sunscreen (n=1036)						
2-3 days/month	139(13.4)	20(11.6)	47(12.9)	53(14.2)	10(11.6)	0.043
2-3 days / week	229(22.1)	27(15.7)	87(23.8)	95(25.5)	16(18.6)	
Everyday	145(14.0)	73(42.4)	149(40.8)	161(43.3)	44(51.2)	
None	446(43.1)	18(10.5)	24(6.6)	24(6.5)	8(9.3)	
2-3 days /year	77(7.4)	34(19.8)	58(15.9)	39(10.5)	8(9.3)	
Cleaning of sunscreen (n=1017)	401(39.4)	57(34.1)	142(39.3)	147(40.4)	39(44.8)	0.367

3.3. Triggering Factors

No significant differences in triggering factors were found between the sensitivity groups in our study. Other triggering factors are shown in Fig. 3.

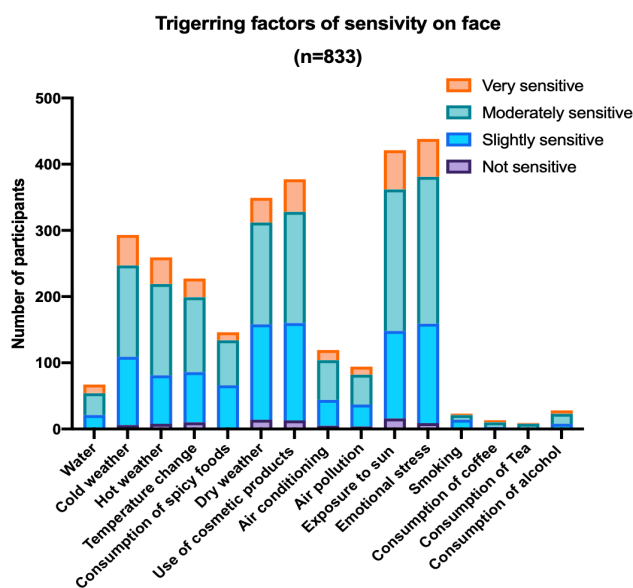


Figure 3. Sensitivity according to triggering factors (n=833). There was a statistically significant difference in terms of water ($p=0.015$), cold weather ($p<0.001$), hot weather ($p<0.001$), temperature changes ($p=0.018$), consumption of spicy food ($p=0.024$), use of cosmetic products ($p=0.006$), exposure to sun ($p<0.001$) and emotional stress ($p<0.001$).

4. DISCUSSION

The prevalence of sensitive skin and its triggering factors have been investigated in many studies in the last decade. As a result, the importance of sensitive skin as a dermatological disease has been recognized. The prevalence rate of sensitive skin varies according to geographical region, with moderately sensitive skin accounting for 44% of cases in Europe, 38% in the United States, 35% in North America, and 31% in Asia. In our study, the prevalence of moderately sensitive skin is nearly similar to the US and North American data (22).

To our knowledge, our study is the first to investigate skin care and makeup habits in individuals with sensitive skin. Important results that may show social differences were also obtained. Whereas individuals with oily-combination skin type were found to be affected more by skin care and makeup habits in a study conducted in patients with rosacea (23), individuals with a dry-combination skin type were more affected in our study with individuals with sensitive skin.

In the rosacea study, taking into account the affected areas, the cause of rosacea was related to excess sebum secretion, whereas in our study, the most affected areas were the chin, upper lip, and cheek, which have dense nerve fibers, sensitive skin may be compatible with the pathophysiology (24).

Basic skin care is evaluated using a three-step approach as follows: cleansing, moisturizing, and sun protection (25). However, little is known about the benefits and clinical significance of skin care to dermatological diseases. Excessive face cleansing and washing, using cleansing gels with high surfactant contents and soaps with high pH levels may damage the skin barrier (26). However, as no significant difference was found between the sensitivity groups in terms of cleaning frequency and cleaning products used, we can infer that the patients with sensitive skin in our study may have learned to pay attention to these features over time while applying basic skin care.

Makeup products are often composed of a complex blend of various inert materials, as well as perfumes, emulsifiers, sunscreens, pigments, metals, resins, and preservatives. Such complex products can trigger skin sensitization. Individuals with very sensitive skin seem to avoid applying makeup. Their use of blush may also be infrequent owing to the erythematous appearance that develops in the cheek area, and published case reports of contact dermatitis warn against the use of blush cosmetics containing carmine (27, 28), which may cause discomfort in individuals with sensitive skin.

Sun protection is important in the management of dermatological disorders. In our study, the participants with sensitive skin reported that their feeling of discomfort increased during sun exposure. The use of sunscreen was frequent in those with sensitive skin. However, awareness that sunscreens can also cause skin sensitization is important (29). In our study, the participants with sensitive skin used sunscreens but not routinely and never used sunscreen cleansers.

While sensitive skin was first shown to be the same entity as or a subgroup of rosacea in a previous study (30), it can now be distinguished from rosacea through diagnostic methods (e.g., reflectance confocal microscopy) (30). In our study, sensitive skin was frequently observed in the patients with rosacea, but the prevalence rates of allergic contact and photocontact dermatitis were also high in the patients with sensitive skin, probably due to the use of makeup and skin care products or skin care habits (31).

Limitations of the study

The limitations of this study include the comparison of different products for the evaluation of skin care and makeup habits. In future studies, the same products should be used to better evaluate the severity of skin sensitization.

5. CONCLUSIONS

The etiological and triggering factors of sensitive skin are still unclear, and the pathogenesis of sensitive skin has not been fully elucidated yet. Finding many products that will not cause skin sensitization by trying each of them is difficult for persons with sensitive skin. This is because the development of epidermal barrier dysfunction can increase the risk of skin

sensitization and those with sensitive skin should be given recommendations about skin care and makeup products and habits.

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Peer-review: Externally peer-reviewed.

Author Contributions:

Research idea: VM, MGK

Design of the study: VM, MGK

Acquisition of data for the study: VM, MGK

Analysis of data for the study: VM, MGK

Interpretation of data for the study: VM, MGK

Drafting the manuscript: VM, MGK

Revising it critically for important intellectual content: VM, MGK

Final approval of the version to be published: VM, MGK

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