

Research on the Skin Concerns of Consumers with Sensitive Skin and Their Attitude and Behavior Toward Derma Products

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Abstract: Consumer reports of self-perceived sensitive skin vary from country to country, with China being the most common. It is a booming market, and it is both an opportunity and challenge for companies who manufacture cosmetics and personal care products to develop sensitive skin-specific products. A study on the cognition of sensitive skin and the evaluation criteria of self-perceived sensitive skin among consumers via comparison by region (China and Singapore), as well as the categories and functions of cosmetics for sensitive skin is conducted. The results are as follows: (1) the skin concerns of consumers with sensitive skin vary by region (China and Singapore), city (Shanghai, Beijing, Wuhan, and Guangzhou), skin type (dry skin and oily skin), and age group (20s and 30s) in China; (2) the participants from Singapore reported more new skin concerns (acne or pimple breakout, clogged pores, and acne scars or acne spots) compared to those from China and believe that the frequency increased following COVID-19; (3) more Singaporean participants perceived “Inappropriate use of skin care products” and “Used products containing harmful ingredient” to be the primary cause of skin sensitivity, whereas those from China felt that “Incomplete makeup removal” is the primary cause; (4) facing skin sensitivity, the participants from both the countries tend to use products specifically designed for sensitive skin and reduce the frequency of using makeup or avoid makeup altogether; the participants from China would also change their lifestyle habits, while those from Singapore tend to simplify or shorten their skincare routine; (5) compared to other cities, the participants from Wuhan tend to use products specifically design for sensitive skin or derma cosmetics at a lower rate (only when there are signs of skin sensitivity); (6) serum is the most used category among Singaporean participants, while those from China favor the use of face cream over face serum; the number of participants from China who use makeup remover among those in their 20s is higher than those in their 30s; lotion or emulsion is preferred in Shanghai, while face cream is preferred in Beijing; (7) Singaporean participants tend to use two separate products, one of which is related to soothing or calming benefit and the other for functional benefit, while those from China tend to choose functional products from brands that are suitable for sensitive skin or derma cosmetic brands. In conclusion, makeup products for sensitive skin, mild makeup removal, and functional products from derma cosmetic brands are potential products in China, while multi-purpose products and serum have shown high potential under the sensitive skincare category in Singapore.

Keywords: Sensitive skin; China; Singapore; Products for sensitive skin

Online publication: April 28, 2022

1. Introduction

The concept of sensitive skin was first introduced in the 1970s ^[1]. Sensitive skin is defined by subjective

complaints of discomfort, nearly always accompanied by visible indicators of irritation and symptoms such as tingling, chafing, burning, or prickling sensations ^[2,3]. Based on previous studies, the prevalence of sensitive skin varies greatly from country to country ^[4,5].

Based on research, sensitive skin affects more than half of the population ^[6]. Around 60 to 70 percent of women reported having sensitive skin to some degree, and there are variances among populations in different geographies. In 2012, a group of researchers discovered that 39.5 percent of respondents to a survey of 9,154 people claimed that their skin is sensitive. In a study conducted in 2020, questionnaires on the subject of skin sensitivity were distributed to 22,085 women in China, of which 49.6 percent claimed that they have skin sensitivity (including “slightly sensitive” and “extremely sensitive”) ^[8]. From this, we can see a significant consumer base with self-perceived sensitive skin all around the world as well as a booming sensitive skincare market in China, especially among women.

Therefore, a study on the cognition of sensitive skin and the evaluation criteria of self-perceived sensitive skin among consumers via comparison by region (China and Singapore), city (Shanghai, Beijing, Wuhan, and Guangzhou), skin type (dry skin and oily skin), and age group (20s and 30s) in China is necessary. Secondly, as the first choice of consumers with self-perceived sensitive skin, derma cosmetics has been one of the fastest growing skincare categories in China. However, the penetration rate of derma cosmetics in China is relatively low compared to other countries. A study on the categories and functions of cosmetics for sensitive skin can cater to the ultimate needs of these consumers, so as to provide various insights for companies to develop products specifically for sensitive skin.

2. Methods

2.1. Respondents

2.1.1. China

A total of 200 female adult respondents in their 20s and 30s have been screened in Beijing (50), Shanghai (50), Guangzhou (50), and Wuhan (50). The respondents have had skin sensitivity issues and are interested in skincare products. There were 102 respondents with oily skin and oily-combination skin, and 98 respondents with dry and dry-combination skin.

2.1.2. Singapore

A total of 102 female adult respondents in their 20s to 30s have been screened in Singapore. The respondents have had skin sensitivity issues and are interested in skincare products.

2.2. Methodology

An online survey was carried out, in which the questionnaires were filled by the respondents.

2.3. Statistical analysis

R 4.1.0 and Excel 2016 were used to analyze the collected data.

3. Results

3.1. Skin concerns of consumers with sensitive skin

3.1.1. Skin concerns

The top three skin concerns of the participants from China include redness, dryness or dehydrated skin, and dull skin, all of which are related to the degree of moisture (lack of moisture). On the other hand, the top three skin concerns of the Singaporean participants include white heads or black heads, clogged pores, and dark eye circles, all of which are related to excessive sebum (**Table 1**).

Table 1. Skin concerns in China and Singapore

Skin concerns	CN	SG	Skin concerns	CN	SG
Acne scars or acne spots	47%	50%	Freckles	22%	12%
Acne or pimple breakout	51%	45%	Itchiness	45%	11%
Blotchy skin	11%	15%	Loss of elasticity	35%	11%
Clogged pores	46%	63%	Oily and greasy skin	41%	28%
Dark eye circles	62%	55%	Rashes	16%	3%
Dehydrated skin or dryness	75%	53%	Redness	82%	23%
Dull skin	73%	44%	Rough skin texture	53%	25%
Enlarged pores	62%	50%	Saggy skin	32%	5%
Eye bags	39%	26%	Thin skin or visible blood vessels	57%	15%
Fatigued skin	27%	36%	Uneven skin tone or hyperpigmentation	45%	43%
Fine lines	59%	26%	White heads or black heads	54%	65%
Flaky skin	47%	7%	Wrinkles	23%	9%

Note: CN, China; SG, Singapore

In China, the top three skin concerns are redness, dryness or dehydrated skin, and dull skin with both age groups (**Table 2**). Those in the same age group from Shanghai, Wuhan, and Beijing have similar skin concerns; however, the participants from Guangzhou have different skin concerns (**Figure 1**). Those participants in their 30s have more skin concerns compared to those in their 20s, which include fine lines, uneven skin tone or hyperpigmentation, loss of elasticity, saggy skin, and wrinkles. These may be due to aging problems (**Table 2**).

Table 2. Skin concerns in China based on different age groups

Skin concerns	20-29	30-39	Skin concerns	20-29	30-39
Acne scars or acne spots	52%	42%	Freckles	17%	28%
Acne or pimple breakout	58%	44%	Itchiness	42%	48%
Blotchy skin	11%	11%	Loss of elasticity	23%	48%
Clogged pores	46%	47%	Oily and greasy skin	42%	41%
Dark eye circles	64%	61%	Rashes	17%	16%
Dehydrated skin or dryness	75%	75%	Redness	79%	86%
Dull skin	65%	81%	Rough skin texture	51%	55%
Enlarged pores	64%	60%	Saggy skin	21%	43%
Eye bags	35%	44%	Thin skin or visible blood vessels	58%	57%
Fatigued skin	24%	30%	Uneven skin tone or hyperpigmentation	33%	57%
Fine lines	47%	72%	White heads or black heads	60%	49%
Flaky skin	52%	43%	Wrinkles	11%	35%

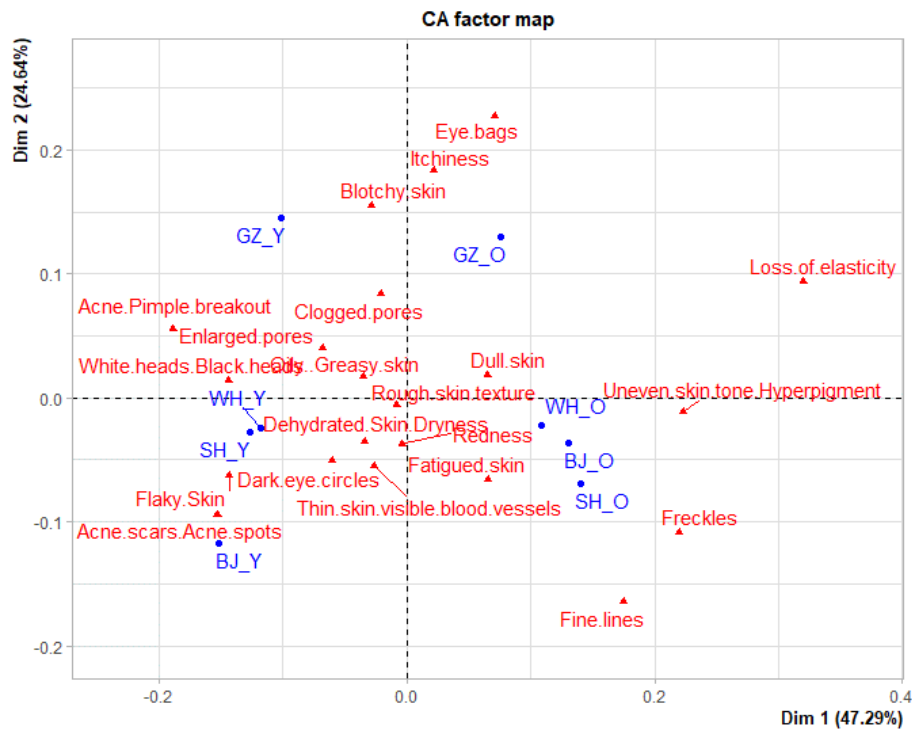


Figure 1. A cross analysis of skin concerns in China based on age and city (Note: GZ_Y, WH_Y, SH_Y, and BJ_Y refer to those in the age group of 20-29 from Guangzhou, Wuhan, Shanghai, and Beijing, respectively; GZ_O, WH_O, SH_O, and BJ_O refer to those in the age group of 30-39 from Guangzhou, Wuhan, Shanghai, and Beijing, respectively)

The ratio of having dehydrated skin or dryness and dark eye circles among participants with dry skin is higher than those with oily skin; the ratio of having enlarge pores, acne or pimple breakout, acne scars or acne spots, clogged pores, as well as oily and greasy skin among participants with dry skin is lower than those with oily skin (**Table 3**). Participants with the same skin type from Shanghai, Wuhan, and Beijing have similar skin concerns, but those from Guangzhou have different skin concerns (**Table 4** and **Figure 2**).

Table 3. Skin concerns in China based on different skin types

Skin concerns	Dry skin	Oily skin	Skin concerns	Dry skin	Oily skin
Acne scars or acne spots	34%	59%	Freckles	28%	16%
Acne or pimple breakout	39%	63%	Itchiness	48%	41%
Blotchy skin	12%	10%	Loss of elasticity	42%	28%
Clogged pores	34%	58%	Oily and greasy skin	10%	72%
Dark eye circles	72%	52%	Rashes	17%	15%
Dehydrated skin or dryness	87%	63%	Redness	82%	82%
Dull skin	71%	75%	Rough skin texture	50%	55%
Enlarged pores	50%	73%	Saggy skin	37%	27%
Eye bags	44%	35%	Thin skin or visible blood vessels	60%	54%
Fatigued skin	28%	25%	Uneven skin tone or hyperpigmentation	47%	42%
Fine lines	64%	54%	White heads or black heads	48%	60%
Flaky skin	53%	42%	Wrinkles	30%	16%

Note: Dry skin refers to dry skin and dry-combination skin; Oily skin refers to oily skin and oily-combination skin

Table 4. Skin concerns in different cities in China

Skin concerns	SH	BJ	GZ	WH	Skin concerns	SH	BJ	GZ	WH
Acne scars and acne spots	49%	46%	43%	49%	Freckles	25%	25%	19%	19%
Acne or pimple breakout	42%	54%	59%	49%	Itchiness	39%	39%	62%	39%
Blotchy skin	7%	10%	14%	12%	Loss of elasticity	37%	29%	41%	33%
Clogged pores	46%	39%	55%	45%	Oily and greasy skin	42%	39%	43%	41%
Dark eye circles	68%	66%	61%	53%	Rashes	14%	6%	25%	20%
Dehydrated skin or dryness	74%	78%	74%	73%	Redness	83%	83%	82%	80%
Dull skin	74%	72%	78%	68%	Rough skin texture	55%	54%	58%	44%
Enlarged pores	65%	47%	67%	68%	Saggy skin	36%	29%	33%	29%
Eye bags	34%	33%	56%	34%	Thin skin or visible blood vessels	62%	61%	56%	50%
Fatigued skin	25%	27%	26%	28%	Uneven skin tone or hyperpigmentation	45%	42%	45%	47%
Fine lines	63%	68%	44%	61%	White heads or black heads	58%	52%	59%	47%
Flaky skin	45%	46%	45%	52%	Wrinkles	22%	19%	19%	32%

Note: SH, Shanghai; BJ, Beijing; GZ, Guangzhou; WH, Wuhan

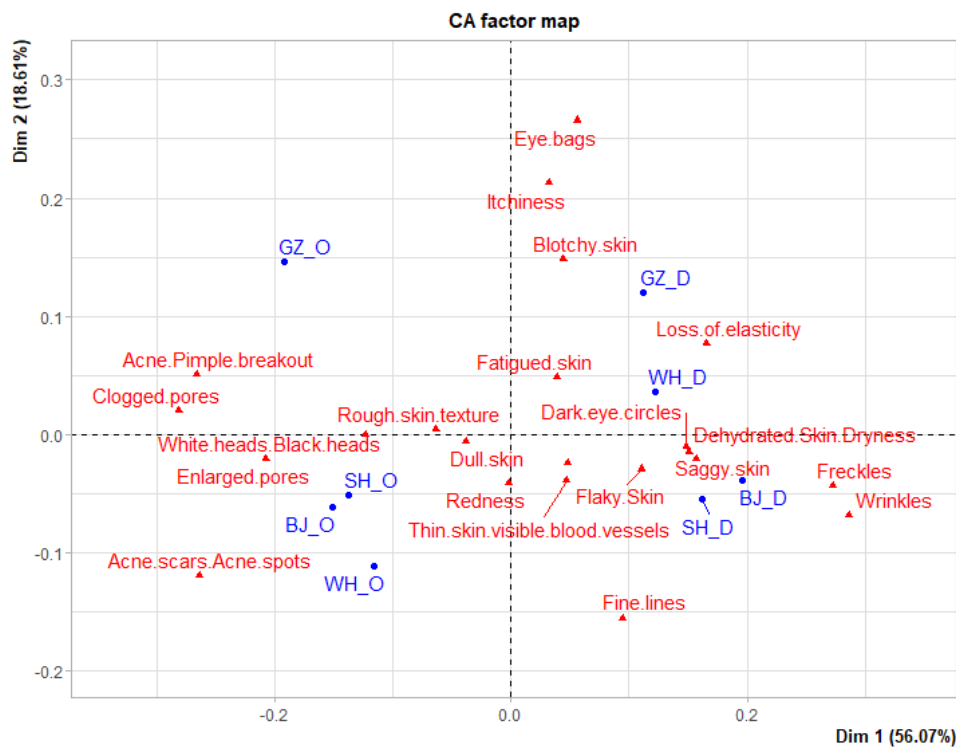


Figure 2. A cross analysis of skin concerns in China based on skin type and city (Note: GZ_D, WH_D, SH_D, and BJ_D refer to participants with dry skin and dry-combination skin from Guangzhou, Wuhan, Shanghai, and Beijing, respectively; GZ_O, WH_O, SH_O, and BJ_O refer to participants with oily skin and oily-combination skin from Guangzhou, Wuhan, Shanghai, and Beijing, respectively)

3.1.2. Signs of sensitive skin

Redness is the most common sign of sensitive skin experienced by the participants from China and Singapore. More participants from China experienced thin skin or visible blood vessels, which may be

attributable to skin dryness or weakened skin barrier. On the other hand, more Singaporean participants experienced acne or pimple breakout, which may be attributable to sebum secretion (**Figure 3**).

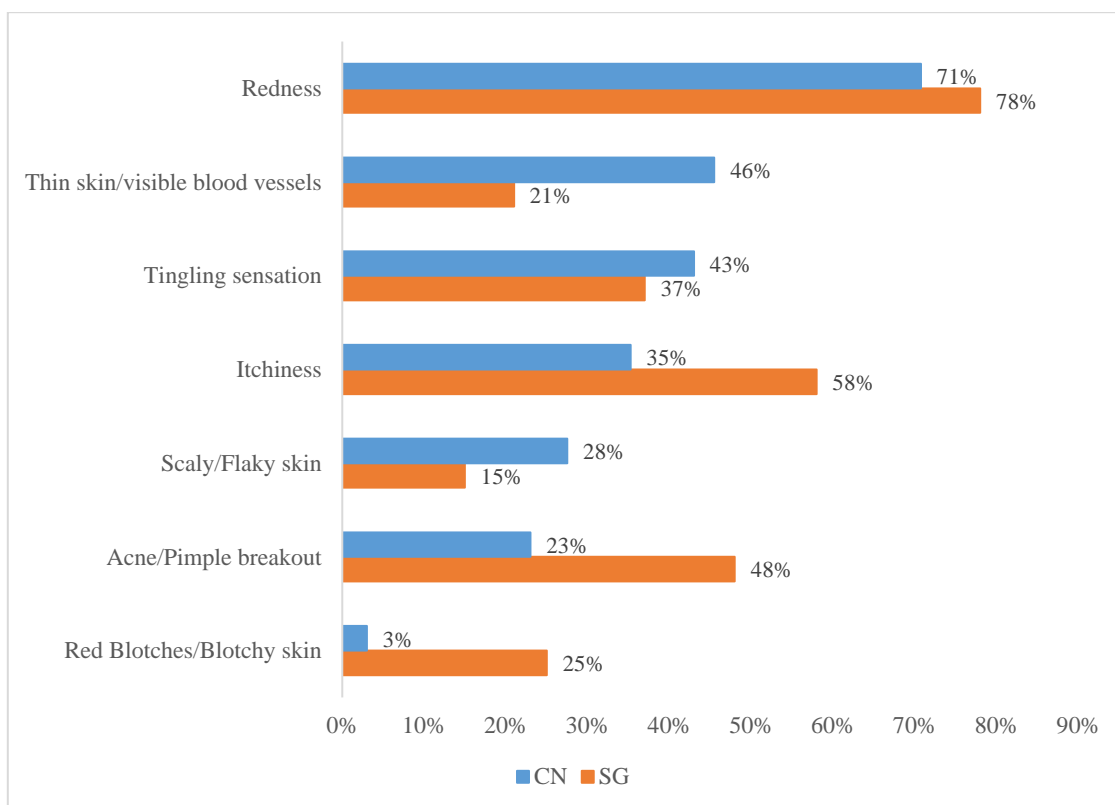


Figure 3. Signs of sensitive skin in China and Singapore (Note: CN, China; SG, Singapore)

In Shanghai, Beijing, and Guangzhou, redness, thin skin or visible blood vessels, and tingling sensation are the top three chosen signs of skin sensitivity. In Guangzhou, the top three signs include redness, itchiness, and thin skin or visible blood vessels (**Table 5**).

Table 5. Skin concerns in different cities in China (Shanghai, Beijing, Wuhan, and Guangzhou)

Skin concerns	SH	BJ	GZ	WH
Redness	75%	74%	71%	63%
Thin skin or visible blood vessels	54%	49%	41%	38%
Tingling sensation	45%	45%	35%	47%
Itchiness	32%	25%	54%	30%
Scaly or flaky skin	27%	25%	24%	34%
Acne or pimple breakout	24%	27%	22%	19%
Red blotches or blotchy skin	0%	4%	2%	6%

Note: SH, Shanghai; BJ, Beijing; GZ, Guangzhou; WH, Wuhan

3.1.3. Effect of COVID-19

Due to the humid climate and the necessity of wearing masks, Singaporean participants had more new skin concerns (acne or pimple breakout, clogged pores, and acne scars or acne spots) (**Table 6**). In China, the ratio of acne or pimple breakout as well as oily and greasy skin among participants with dry skin after COVID-19 is lower than those with oily skin (**Table 7**).

Table 6. New skin concerns following COVID-19 in China and Singapore

Skin concerns	CN	SG	Skin concerns	CN	SG
Acne scars or acne spots	10%	29%	Itchiness	7%	11%
Acne or pimple breakout	18%	67%	Loss of elasticity	7%	5%
Blotchy skin	1%	4%	No new concerns	30%	13%
Clogged pores	12%	34%	Oily and greasy skin	9%	10%
Dark eye circles	12%	9%	Rashes	4%	13%
Dehydrated skin or dryness	17%	14%	Redness	10%	15%
Dull skin	12%	17%	Rough skin texture	10%	16%
Enlarged pores	14%	9%	Saggy skin	6%	2%
Eye bags	10%	7%	Thin skin or visible blood vessels	5%	1%
Fatigued skin	8%	11%	Uneven skin tone or hyperpigmentation	8%	11%
Fine lines	8%	6%	White heads or black heads	13%	19%
Flaky skin	4%	3%	Wrinkles	5%	2%
Freckles	3%	3%			

Note: CN, China; SG, Singapore

Table 7. New skin concerns following COVID-19 in China: oily skin versus dry skin

Skin concerns	Dry skin	Oily skin	Skin concerns	Dry skin	Oily skin
Acne scars or acne spots	6%	13%	Itchiness	5%	10%
Acne or pimple breakout	13%	23%	Loss of elasticity	9%	5%
Blotchy skin	2%	0%	No new concerns	32%	27%
Clogged pores	10%	15%	Oily and greasy skin	2%	16%
Dark eye circles	13%	11%	Rashes	3%	4%
Dehydrated skin or dryness	21%	13%	Redness	7%	12%
Dull skin	12%	12%	Rough skin texture	8%	13%
Enlarged pores	12%	16%	Saggy skin	6%	5%
Eye bags	12%	8%	Thin skin or visible blood vessels	6%	3%
Fatigued skin	7%	9%	Uneven skin tone or hyperpigmentation	9%	7%
Fine lines	7%	9%	White heads or black heads	10%	16%
Flaky skin	5%	3%	Wrinkles	6%	3%
Freckles	4%	1%			

Note: Dry skin refers to dry skin and dry-combination skin; Oily skin refers to oily skin and oily-combination skin

More Singaporean participants felt that the frequency of skin sensitivity changes increased following COVID-19 in comparison to participants from China (**Figure 4**). The frequency in Guangzhou following COVID-19 is higher than that in Wuhan (**Figure 5**).

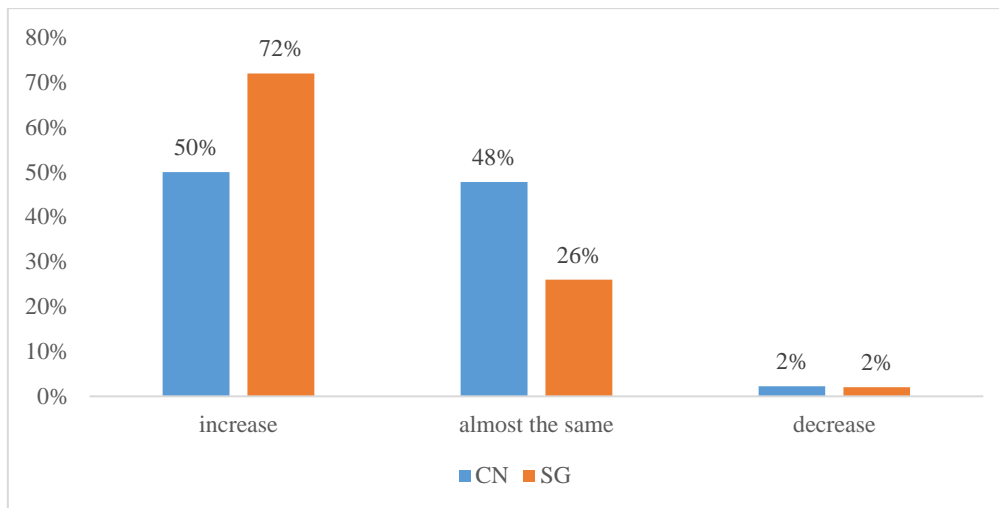


Figure 4. Frequency of skin sensitivity changes following COVID-19 in China and Singapore (Note: CN, China; SG, Singapore)

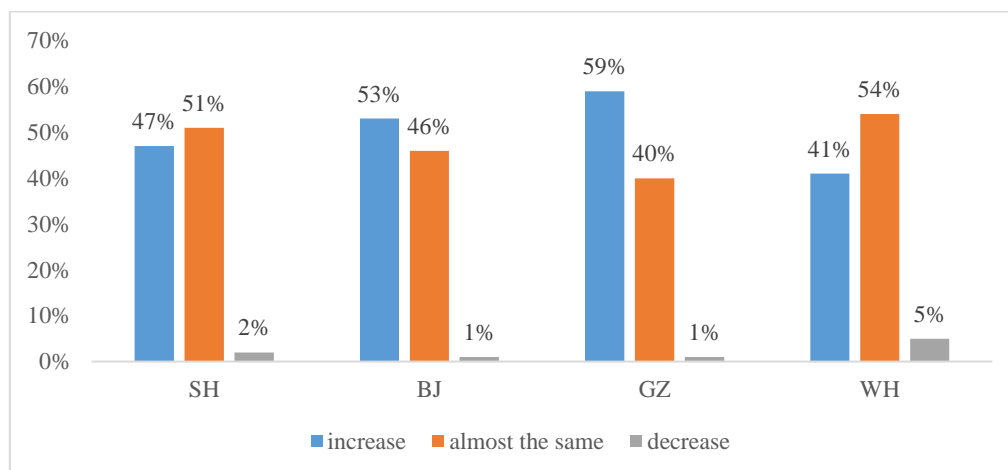


Figure 5. Frequency of skin sensitivity changes following COVID-19 in different cities in China

Due to similar climate, participants from Guangzhou and Singapore have similar skin concerns. For example, there is a higher ratio of acne or pimple breakout but a lower ratio of fine line, influenced by COVID-19.

3.2. Knowledge and behavior toward sensitive skin

3.2.1. Causes

Compared to participants from China, more Singaporean participants perceived “Inappropriate use of skin care products” and “Used products containing harmful ingredient” to be the primary cause of skin sensitivity (**Figure 6**).

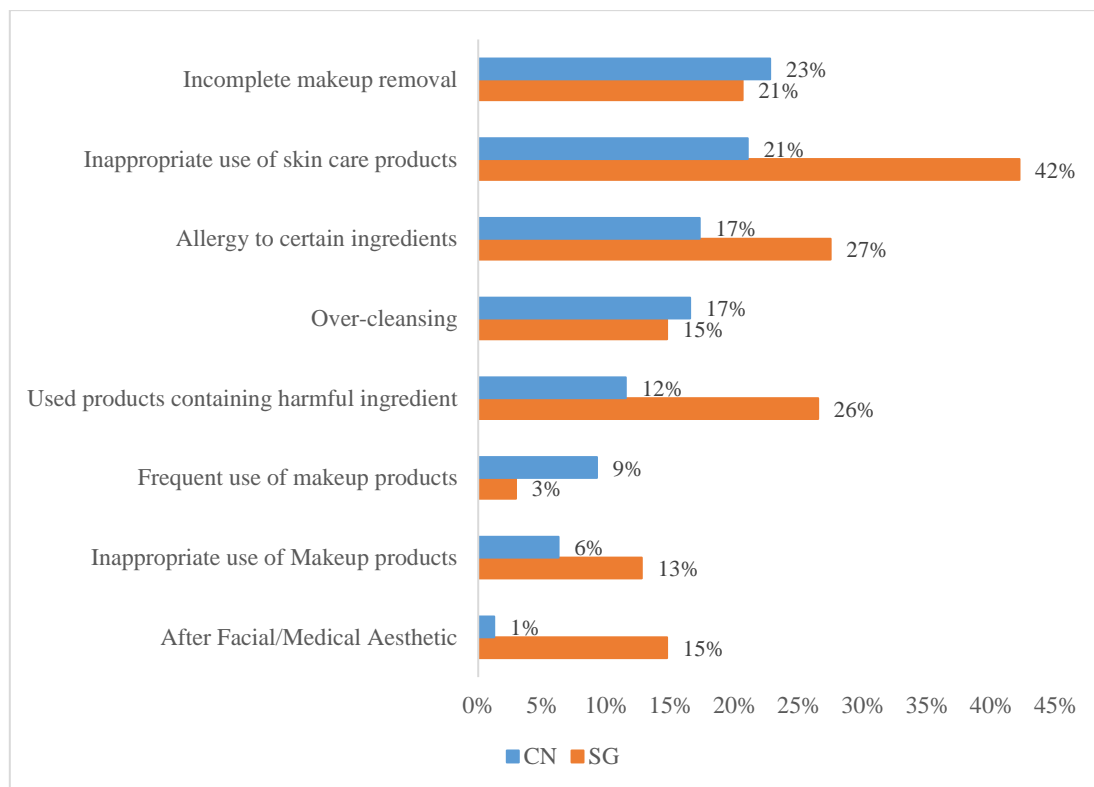


Figure 6. Causes of skin sensitivity in China and Singapore (Note: CN, China; SG, Singapore)

In Shanghai, Beijing, Wuhan, and Guangzhou, the top three reasons of skin sensitivity include “Incomplete makeup removal,” “Inappropriate use of skin care products,” and “Over-cleansing” (Table 8). In China, more participants in the age group of 20-29 felt that “incomplete makeup removal” will cause skin sensitivity compared to those in the age group of 30-39 (Figure 7).

Table 8. Causes of skin sensitivity in different cities in China (Shanghai, Beijing, Wuhan, and Guangzhou)

Causes	SH	BJ	GZ	WH
Inappropriate use of skin care products	17%	24%	21%	22%
Over-cleansing	17%	14%	15%	20%
Inappropriate use of makeup products	6%	6%	5%	8%
Incomplete makeup removal	27%	21%	18%	25%
Used products containing harmful ingredient	8%	11%	17%	10%
Frequent use of makeup products	12%	11%	6%	8%
After facial or medical aesthetic	2%	0%	2%	1%
Allergy to certain ingredients	15%	16%	17%	21%

Note: SH, Shanghai; BJ, Beijing; GZ, Guangzhou; WH, Wuhan

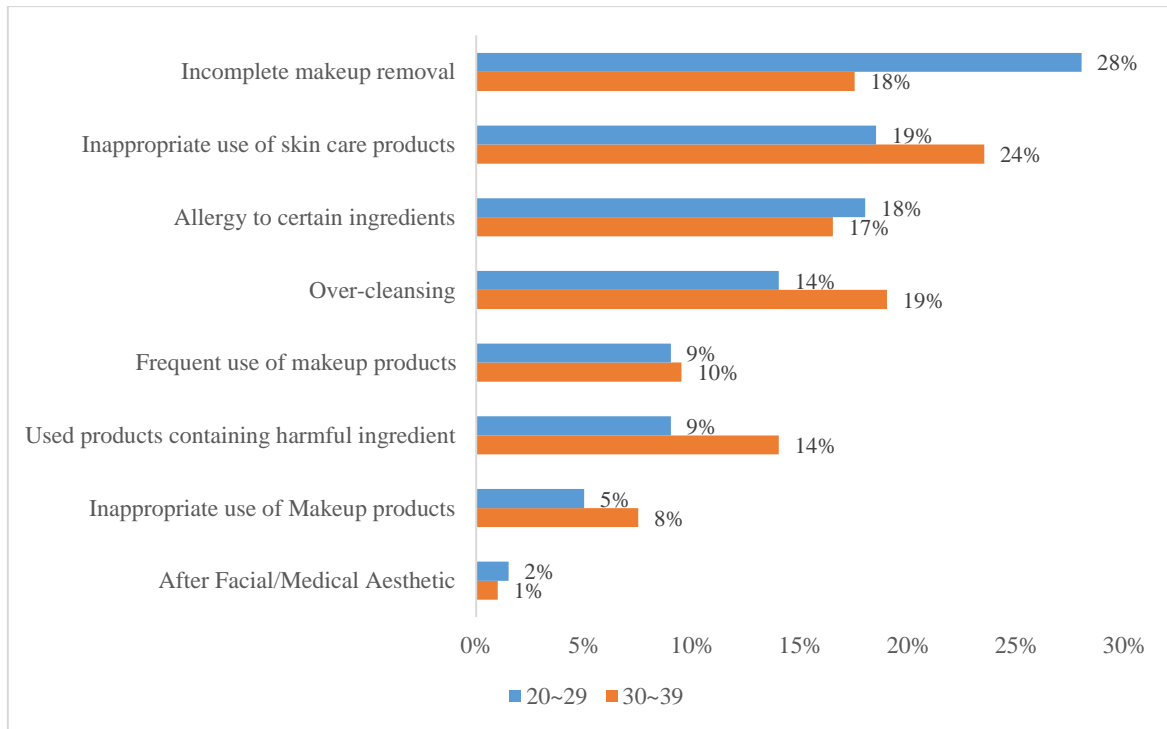


Figure 7. Causes of skin sensitivity in China based on age group

3.2.2. Behavior

Facing skin sensitivity, the participants from both the countries tend to use products specifically designed for sensitive skin and reduce the frequency of using makeup or avoid makeup altogether. Meanwhile, the participants from China would also modify their lifestyle habits, whereas Singaporean participants tend to simplify or shorten their skincare routine (**Figure 8**).

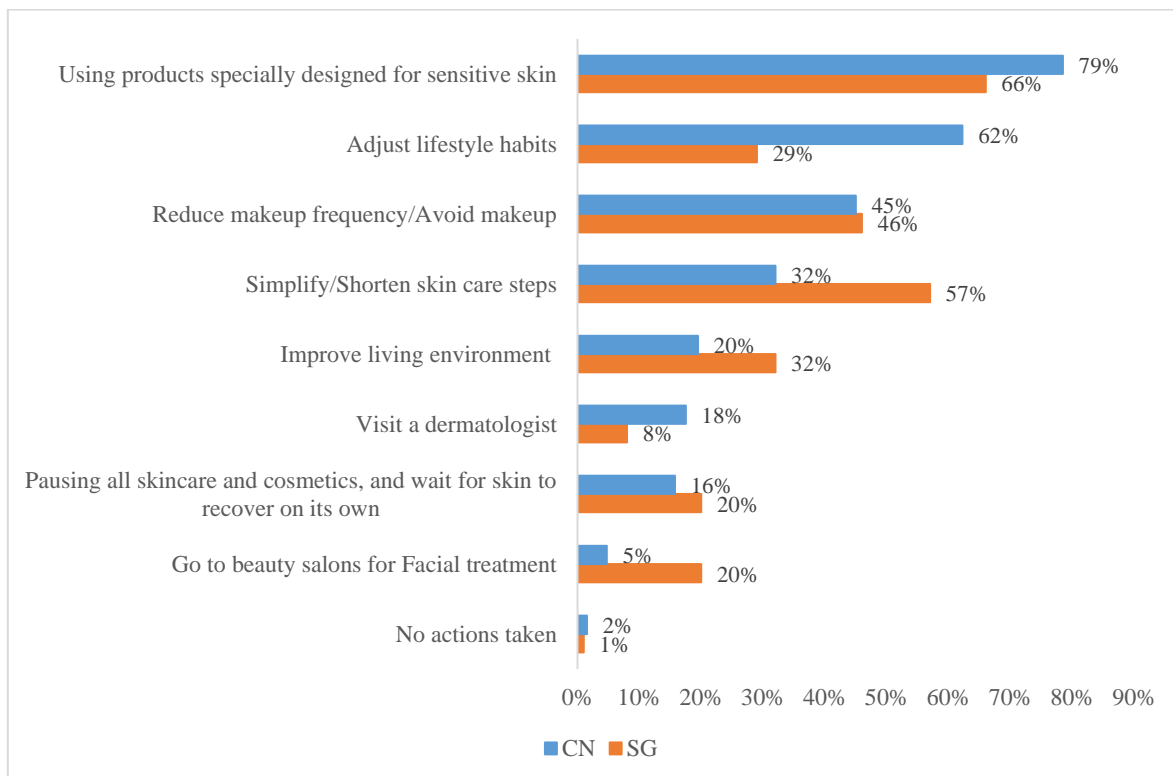


Figure 8. Measures taken to deal with skin sensitivity in China and Singapore (Note: CN, China; SG, Singapore)

Compared to participants from Beijing, those from Wuhan tend to simplify or shorten their skin care routine. Compared to those from Wuhan, participants from Shanghai tend to use products specifically designed for sensitive skin (**Table 9**). Participants with oily skin tend to simplify or shorten their skin care routine in the face of skin sensitivity more than those with dry skin (participants with oily skin tend to develop oily or greasy skin easily). The ratio of using products specifically designed for sensitive skin by participants with dry skin is higher than those with oily skin (**Table 10**).

Table 9. Measures taken to deal with skin sensitivity in different cities in China

Measures \ Cities in China	SH	BJ	GZ	WH
Modify lifestyle habits	61%	72%	60%	56%
Visit beauty salons for facial treatment	4%	8%	5%	2%
Improve living environment	20%	15%	28%	15%
No actions taken	1%	0%	3%	2%
Withholding the use of all kinds of skincare products and cosmetics, while waiting for the skin to recover on its own	15%	11%	14%	23%
Reduce the frequency of using makeup or avoid makeup altogether	41%	51%	41%	47%
Simplify or shorten skin care routine	33%	23%	32%	40%
Using products specifically designed for sensitive skin	85%	84%	77%	68%
Visit a dermatologist	17%	11%	21%	21%

Note: SH, Shanghai; BJ, Beijing; GZ, Guangzhou; WH, Wuhan

Table 10. Measures taken to deal with skin sensitivity in China based on different skin types

Measures \ Skin type	Dry Skin	Oily Skin
Modify lifestyle habits	67%	57%
Visit beauty salons for facial treatment	5%	4%
Improve living environment	19%	20%
No actions taken	2%	1%
Withholding the use of all kinds of skincare products and cosmetics, while waiting for the skin to recover on its own	15%	16%
Reduce the frequency of using makeup or avoid makeup altogether	48%	42%
Simplify or shorten skin care routine	24%	40%
Using products specifically designed for sensitive skin	83%	74%
Visit a dermatologist	15%	20%

Note: Dry skin refers to dry skin and dry-combination skin; Oily skin refers to oily skin and oily-combination skin

3.3. Attitude toward products specifically designed for sensitive skin

3.3.1. Characteristic

The participants from both the countries mostly chose “Helps to enhance or repair skin barrier” and “Free from harmful ingredients or addictive.” However, the participants from China pay more attention to visible effect (able to fix specific skin concern), while Singaporean participants pay more attention to public praise (researched and developed with skin centers or clinics and passed dermatological tests) (**Figure 9**).

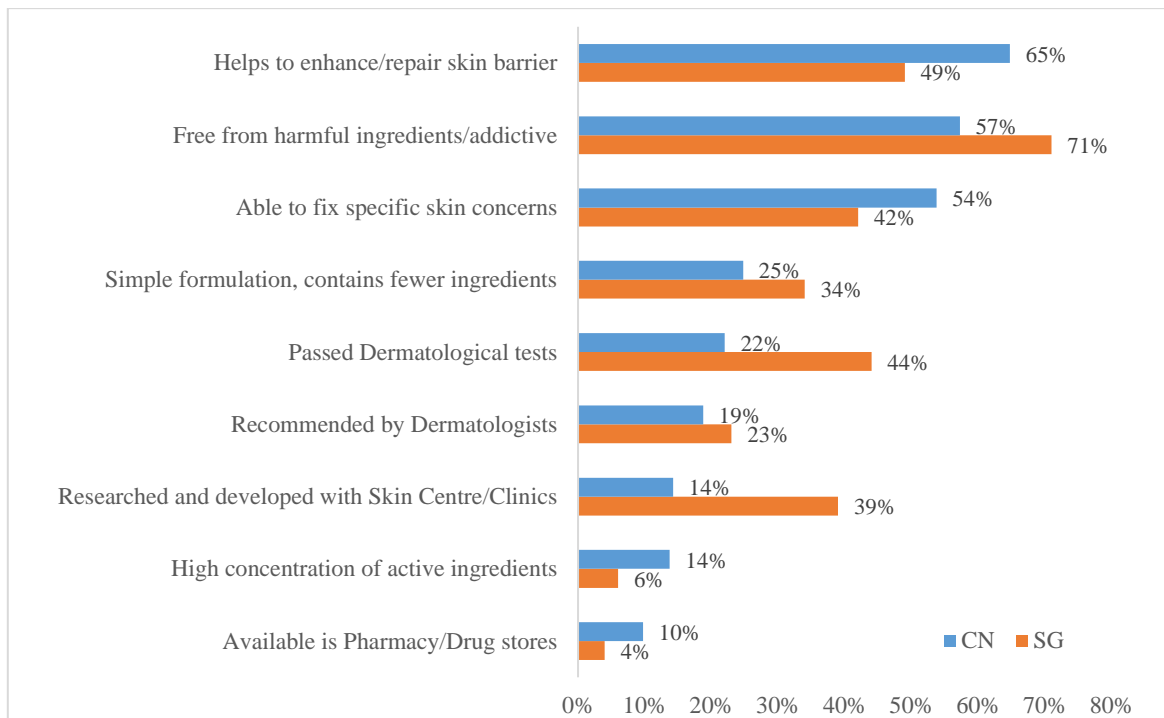


Figure 9. Characteristics of derma cosmetics in China and Singapore (Note: CN, China; SG, Singapore)

In China, the number of participants in their 20s who prefer “Recommendation by dermatologists” is higher; the number of participants in their 30s who prefer “Free from harmful ingredients or addictive” is higher. In Shanghai, Beijing, and Wuhan, more participants in their 30s prefer products free from harmful ingredients or addictive compared to those in their 20s; however, more participants in their 20s prefer products recommended by dermatologists compared to those in their 30s (**Figure 10**).

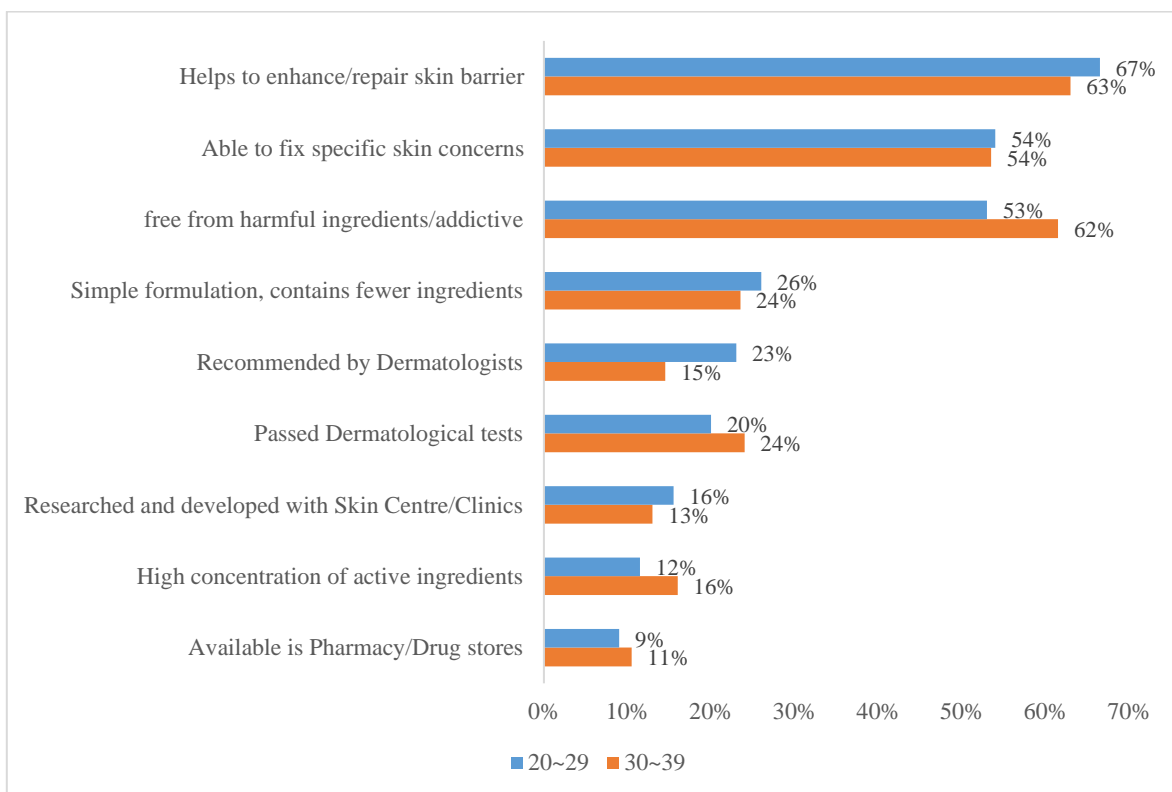


Figure 10. Characteristics of derma cosmetics in China based on age group

3.3.2. Reason for use

More participants from China use derma cosmetics on a long-term basis compared to Singaporean participants, who tend to use derma cosmetics only when there are signs of skin sensitivity (**Figure 11**).

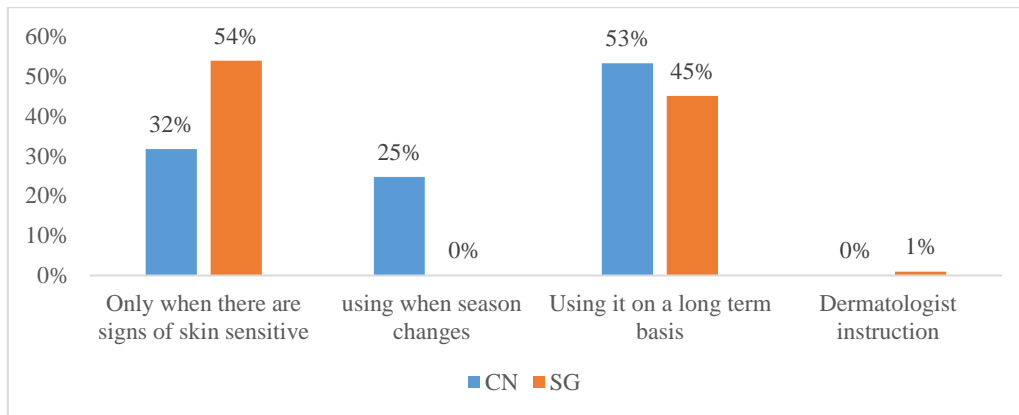


Figure 11. Reason for using derma cosmetics in China and Singapore (Note: CN, China; SG, Singapore)

Compared to other cities, participants from Wuhan tend to use products specifically design for sensitive skin or derma cosmetics at a lower rate (only when there are signs of skin sensitivity). Therefore, Wuhan may be a potential market for sensitive skin products (**Figure 12**).

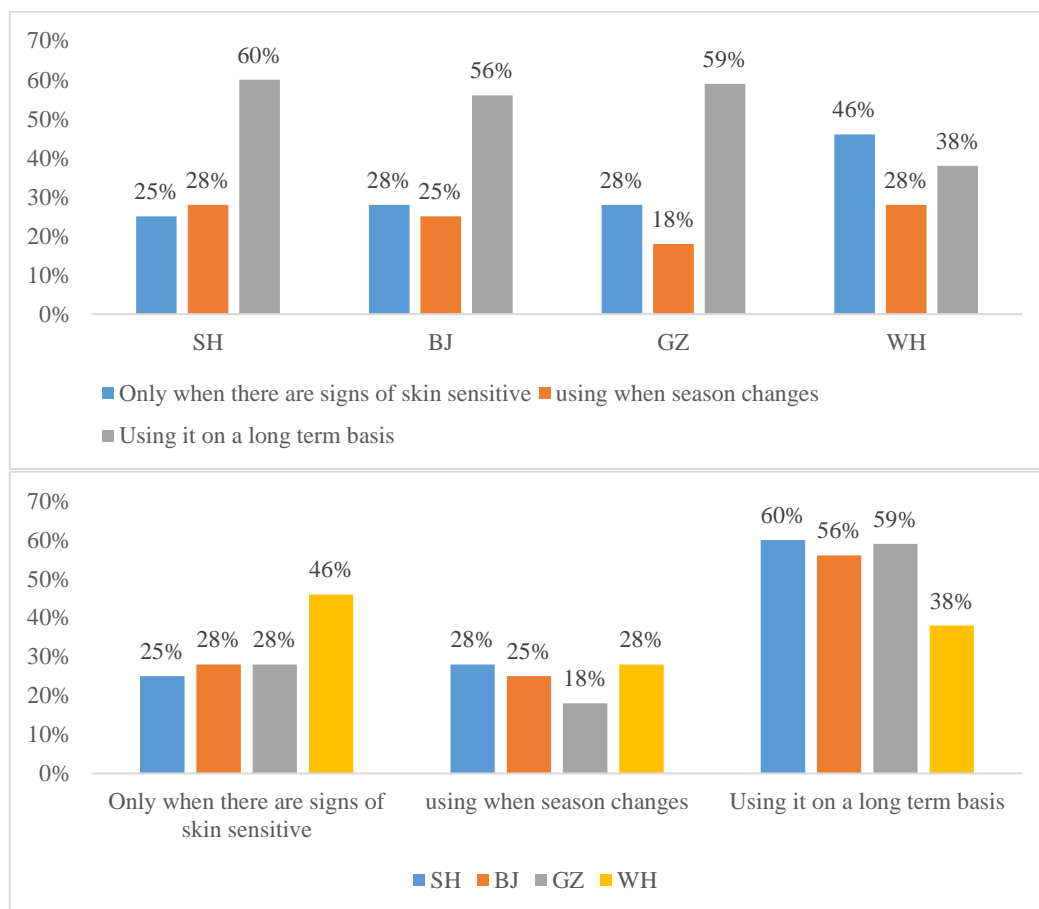


Figure 12. Reason for using derma cosmetics in China (Note: SH, Shanghai; BJ, Beijing; GZ, Guangzhou; WH, Wuhan)

3.3.3. Category

With sensitive skin, serum is the most used category among Singaporean participants, while those from China favor the use of face cream over face serum (**Figure 13**).

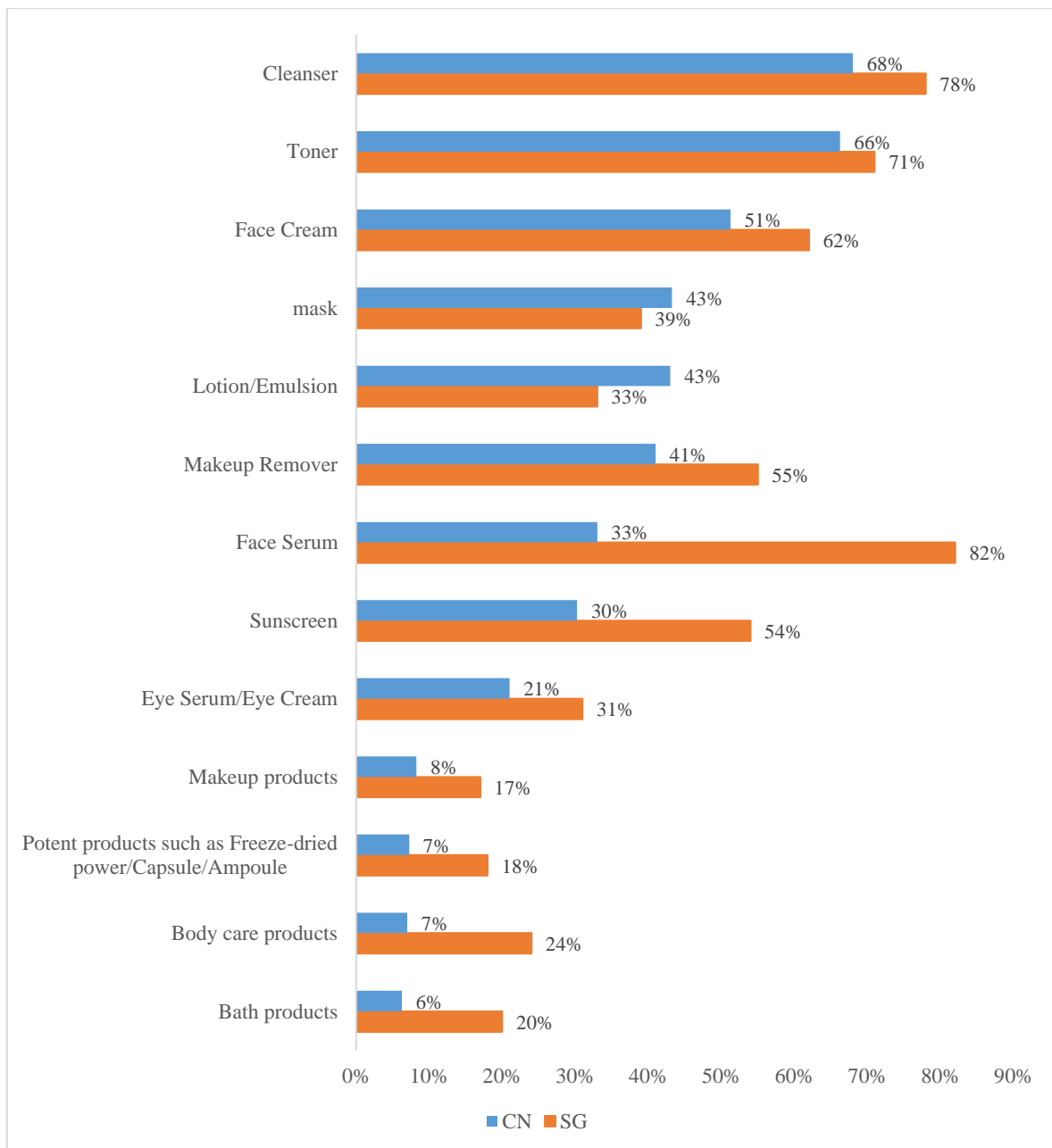


Figure 13. Usage of derma cosmetics based on category in China and Singapore (Note: CN, China; SG, Singapore)

Cleansers and toners are the most frequently used derma cosmetics among the participants in the four cities when facing skin sensitivity. In Shanghai, participants are more likely to use lotion or emulsion than in Beijing, yet face cream is more popular in Beijing than in Shanghai. In Guangzhou, there are less people who use cleaner than in other cities (**Figure 14**).

Facing skin sensitivity, the ratio of using makeup remover by participants in their 20s is higher than those in their 30s (**Figure 15**). In the four cities, participants in their 30s use similar products to deal with skin sensitivity; however, those in their 20s use different products (**Figure 16**).

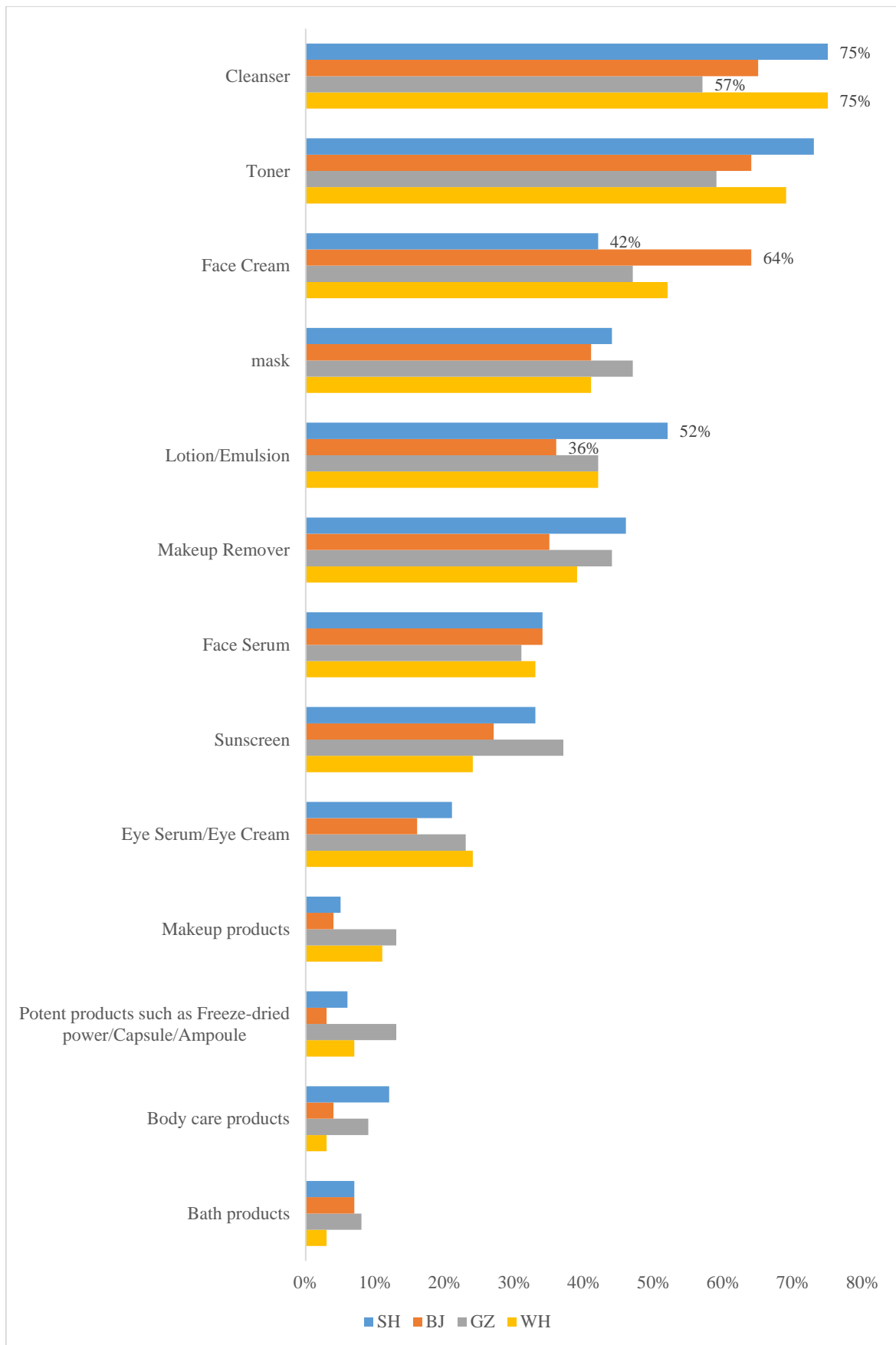


Figure 14. Usage of derma cosmetics based on category in different cities in China (Note: SH, Shanghai; BJ, Beijing; GZ, Guangzhou; WH, Wuhan)

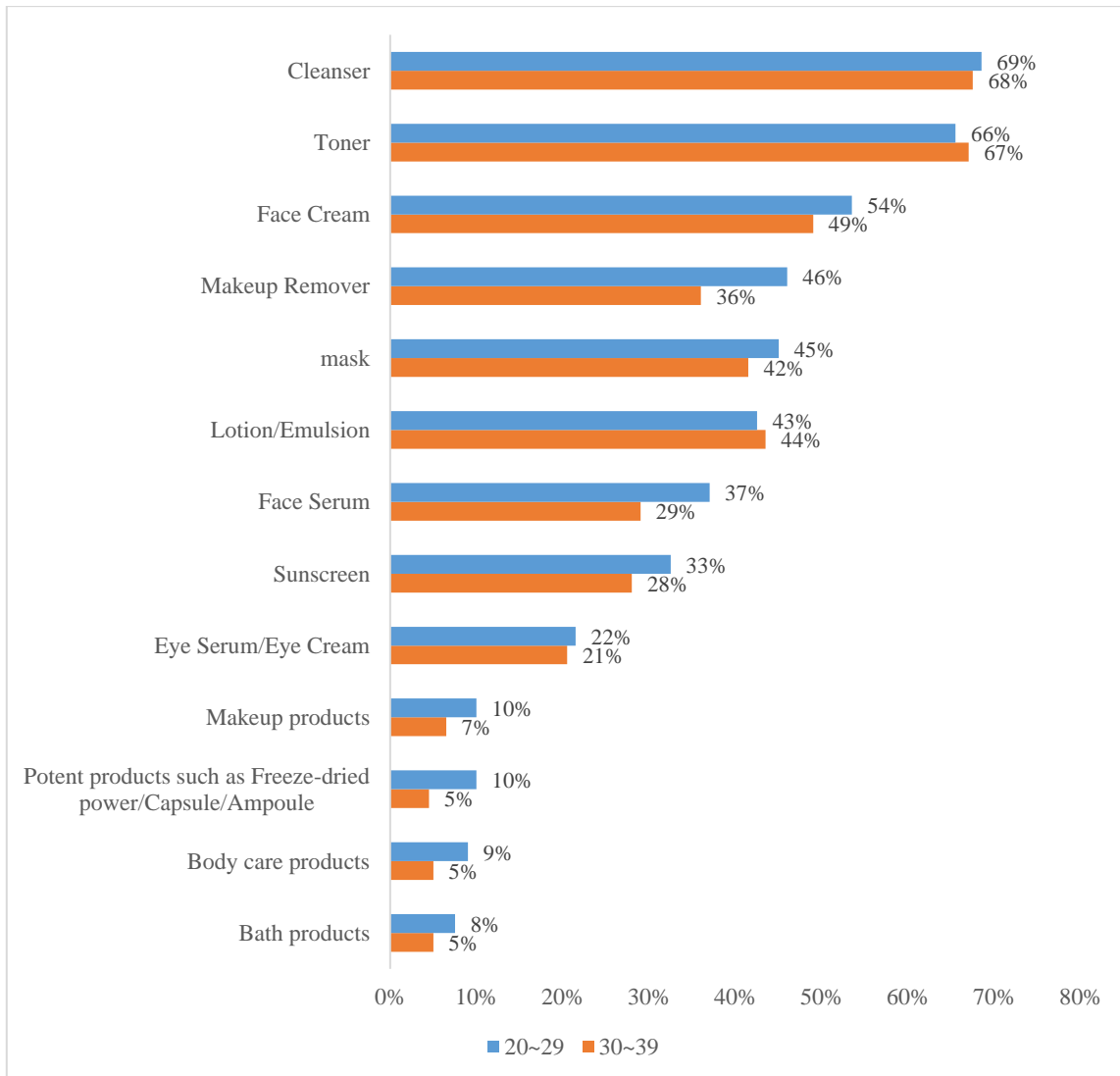


Figure 15. Usage of derma cosmetics based on category among different age groups in China

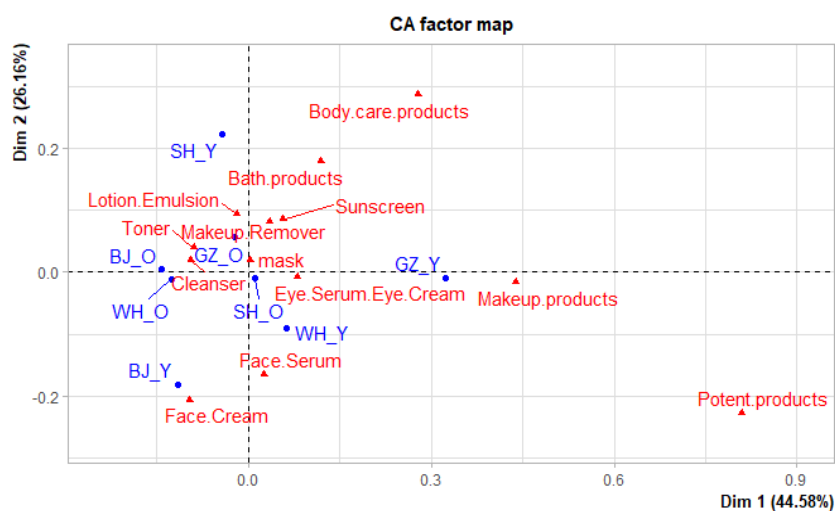


Figure 16. A cross analysis of the usage of derma cosmetics based on category in China in regard to age and city (Note: GZ_Y, WH_Y, SH_Y, and BJ_Y refer to participants in the age group of 20-29 from Guangzhou, Wuhan, Shanghai, and Beijing, respectively; GZ_O, WH_O, SH_O, and BJ_O refer to participants in the age group of 30-39 from Guangzhou, Wuhan, Shanghai, and Beijing, respectively)

3.3.4. Usage of functional products

With sensitive skin, functional products are important for participants from both countries. Singaporean participants tend to use two separate products, one of which for a soothing or calming effect and the other for functional benefits; on the other hand, participants from China tend to choose functional products from brands that are suitable for sensitive skin or derma cosmetic brands (Figure 17).

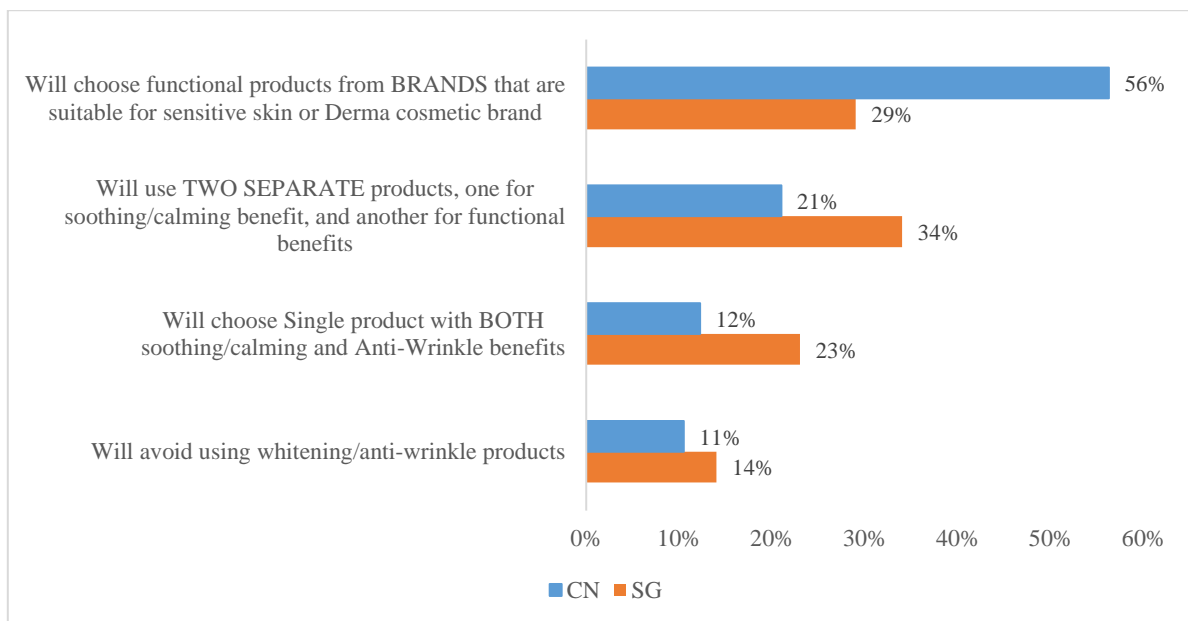


Figure 17. Usage of functional products for sensitive skin in China and Singapore (Note: CN, China; SG, Singapore)

4. Discussion

Cosmetics designed specifically for sensitive skin have a large potential market in China. Participants who have sensitive skin tend to use products specifically designed for sensitive skin; 70 percent of the participants from China claimed that their skin concerns increased following COVID-19, which is similar to what happened in Singapore. Following COVID-19, the market for cosmetics specifically designed for sensitive skin will continue to expand. The consumers in Wuhan are not as matured compared to those in other cities. Hence, Wuhan is a potential market. More information on sensitive skin and its products should be broadcasted to encourage the consumers in Wuhan to use these products. Due to different climates in Beijing and Guangzhou, their consumers have different skin concerns (consumers in Beijing have more sensitive skin and skin concerns associated with dryness, while consumers in Guangzhou have more skin complaints related to pores and acne and are more influenced by COVID-19). Although more than half of the participants in this study have the habit of using makeup products, they tend to reduce the frequency of using makeup products or avoid makeup altogether when their skin is sensitive. This may be an opportunity to develop makeup products specifically for sensitive skin. Incomplete makeup removal is thought to be one of important reasons that cause skin sensitivity. Hence, mild makeup removal is another feature that can be developed. Functional products from derma cosmetic brands are also potential products to be developed, especially for those in their 30s who also have other skin concerns, such as fine lines, uneven skin tone or hyperpigmentation, loss of elasticity, saggy skin, and wrinkles in addition to sensitive skin.

In Singapore, there has also been an increase in the frequency of sensitive skin post COVID-19, owing primarily to the use of masks, which has resulted in acne or pimple breakout, thus increasing the sensitivity of skin. The sensitive skincare category seems to have a high market potential. The behavior of consumers in shortening or simplifying their skincare routine connotes a need for multi-purpose products (there are products that combine toner and moisturizer in a single step) to effectively lessen the number of products

applied to their skin without affecting the overall benefit sought, although serum showed high potential under the sensitive skincare category and is favored by more than 80 percent of the respondents in their selection of sensitive skin care products, along with cleanser and toner.

Disclosure statement

The authors declare no conflict of interest.

References

- [1] Frosch PJ, Kligman AM, 1977, A Method for Appraising the Stinging Capacity of Topically Applied Substances. *J Soc Cosmet Chem*, 28: 197-209.
- [2] Misery L, Sibaud V, Merial-Kieny C, et al., 2011. Sensitive Skin in the American Population: Prevalence, Clinical Data, and Role of the Dermatologist. *International Journal of Dermatology*, 50(8): 961-967.
- [3] Qiao Z, Huang S, Leng F, et al., 2021, Analysis of the Bacterial Flora of Sensitive Facial Skin Among Women in Guangzhou. *Clinical, Cosmetic and Investigational Dermatology*, 14: 655-664. <https://doi.org/10.2147/CCID.S307668>
- [4] Farage MA, Mandl CP, Berardesca E, et al., 2012, Sensitive Skin in China. *Journal of Cosmetics, Dermatological Sciences and Applications*, 2(03): 184.
- [5] Wang X, Su Y, Zheng B, et al., 2020, Gender-Related Characterization of Sensitive Skin in Normal Young Chinese. *Journal of Cosmetic Dermatology*, 19(5): 1137-1142.
- [6] Farage MA, 2019, The Prevalence of Sensitive Skin. *Front Med*, 6: 98. DOI: 10.3389/fmed.2019.00098
- [7] Xu F, Yan S, Wu M, et al., 2012, Self-Declared Sensitive Skin in China: A Community-Based Study in Three Top Metropolises. *Journal of the European Academy of Dermatology and Venereology*, 27(3): 370-375.
- [8] Xiao X, Qiao L, Ye R, et al., 2020, Nationwide Survey and Identification of Potential Stress Factor in Sensitive Skin of Chinese Women. *Clinical, Cosmetic and Investigational Dermatology*, 13: 867-874. DOI: 10.2147/CCID.S284359

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