# Differences in Safety Perceptions of Use According to Cosmetic Information of Women

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## Abstract

**Purposes:** This is a study on the perception of safety in use according to cosmetic information. **Research design, data and methodology:** As a result of analyzing 324 women in their twenties living in the metropolitan area, the following conclusions were drawn. **Results:** As a result of measuring the awareness of cosmetic information, the awareness of 'cosmetic-related knowledge' (M=3.52) and 'cosmetic performance' (M=3.43) was high, indicating that information on cosmetic knowledge was actively shared with each other. It was understood that the method of use and effect were properly recognized and that the cosmetics were selected. 'Correct cosmetic storage method' is significant in the factors of interest in cosmetics (p<.001), and 'the harmful ingredients of cosmetics that should be avoided' are significant in the factors of cosmetic information (p<0.05) and the factors of interest in cosmetics (p<0.01). 'Trouble-causing ingredients' showed a statistically significant difference in safety perception in all factors except cosmetic performance factors. **Conclusion:** There is a need to construct a system that allows consumers to easily purchase cosmetics that are necessary for their skin by schematically or simplifying the information on the usage period and trouble-causing ingredients after opening the cosmetics to be easily understood.

**Keywords**: Safety perception, Cosmetic information, Harmful ingredients, Trouble ingredients

**JEL Classification Code:** I10, I12, I18, I19

# 1. Introduction

In recent years, the cosmetics industry is selling numerous types of cosmetics with various ingredients and effects in

order to satisfy consumers' diversified desires for cosmetics (Lee, 2011). Accordingly, the purchase rate of consumers is increasing in line with the new cosmetics released every quarter, but the number of side effects damage caused by cosmetics is also increasing every year.

As the Enforcement Regulations of the Cosmetics Act have been revised for the safe use of cosmetics by consumers in the country, all cosmetics sold in Korea must indicate the period of use and date of manufacture after opening (Ministry of Government Legislation, 2020a). As for the notation method, the expiration date should include characters such as 'expiration date' or 'up to 0000' and 'year, month and day'. As for the period of use after opening, a combination of the letter "after opening use period" and "00 months" or "00 months" was proposed, or a symbol indicating the period of use after opening and the period was suggested (Ministry of Government Legislation, 2020a).

Such a description method can be recognized when purchasing, but the display of information is often blurred or erased when used, so it is difficult to find related information when information about the expiration date is actually needed.

In addition, the symbol, which means the period of use after opening, can be easily found on the product, but most consumers are not provided with accurate information about the symbol. Safety awareness is insufficient Kim and Cho's research (2008) is an experiment on microbial contamination of cosmetics. Lip cosmetics were used for 3 months and 6 months, respectively, by use period and formulation. As a result, it was announced that a large amount of aerobic bacteria was detected in all samples, threatening skin health (Kim & Cho, 2008). Cosmetics must ensure safety, stability, usability, and effectiveness. Among them, stability means that there is no deterioration, discoloration, change of odor and contamination of microorganisms due to storage (Ha, 2013). Cosmetics that do not keep the expiration date after opening or whose expiration date cannot be confirmed are highly susceptible to deterioration, and many microorganisms may multiply due to incorrect usage. When microorganisms are contaminated with cosmetics, microorganisms grow and reproduce on the surface or in the contents, and a sediment, turbid state, thin film, etc., formed due to various chemical reactions (Orth, 1989). Therefore, it can be seen that one of the reasons why many people suffer from skin troubles while using products with high prices and various performances is that they cannot keep the usage period after opening.

Due to the coronavirus infection that is spreading around the world, interest in safety is increasing. In addition, a personalized cosmetics system has been introduced and is about to be activated. It identifies the level of awareness of women in their twenties on the use safety according to cosmetic information, and proposes correct cosmetic use safety from a consumer perspective. The purpose of this study is to provide basic data for establishing a system that can increase the satisfaction and reliability of cosmetics.

# 2. Theoretical Background

## 2.1. The Concept of Cosmetics

According to Article 2, Paragraph 1 of the Cosmetics Act, the term 'cosmetics' is a similar method such as applying, rubbing or spraying on the human body in order to clean and beautify the human body to add attractiveness and change appearance, or to maintain or promote the health of skin and hair. It is a product that has a slight effect on the human body (Ministry of Government Legislation, 2020b). In other words, cosmetics are made by mixing various ingredients and are used to maintain beauty by cleaning and protecting the body. Legally, cosmetics are those that have relatively little pharmacological effect on the human body, unlike pharmaceuticals or quasi-drugs. Functional cosmetics with enhanced specific functions related to whitening, sun protection, and wrinkle improvement are called functional cosmetics, which have properties between cosmetics and quasi-drugs (Ministry of Government Legislation, 2020a).

## 2.2. The Definition of Cosmetic Safety

Unlike pharmaceuticals, cosmetics are products that are used throughout the human body by many unspecified people for a long period of time, so safety must be ensured so that there are no side effects to the human body. The four major requirements for cosmetics are as shown in Table 1 below, and the safety is that there is no skin irritation, allergy, or toxicity (Ministry of Government Legislation, 2020a).

**Table 1:** Four Major Requirements for Cosmetics

| Type | Contents |
|------|----------|
| Safety | No skin irritation, allergy or toxicity |
| Stability | There should be no deterioration, discoloration, change of odor, contamination by microorganisms |
| Usability | When used on the skin, it is easy to work with your hands, and it will soak into the skin smoothly. |
| Efficacy | Appropriate moisturizing, anti-aging, UV protection, whitening, washing, and color effects |

## 2.3. The Information of Cosmetic Safety

Cosmetic safety information refers to information that enables consumers to confirm the stability of the product they are trying to purchase or the product they are using. In order to provide consumers with the right to know, the 'All Ingredients Labeling System' was implemented to label all ingredients in cosmetics sold on October 18, 2008. Recently, as cases of side effects appear one after another, interest in not only all ingredients but also other safety information is increasing. Consumers can use cosmetics correctly through safety information.

### 2.3.1. All Cosmetic Ingredients

The cosmetic all-ingredient labeling system is a system in which all ingredients are labeled on the cosmetic container or packaging. This is a system implemented for the purpose of selecting a product that suits the consumer's personal constitution or preference, and to quickly identify the cause through epidemiological investigations when side effects occur (Jung, 2008). The size of the letters should be 5 points or more, starting with components with a high content, and components, flavors or coloring agents used in less than 1% can be written in any order. Flavoring agents can be expressed as 'fragrance'. However, starting from January 2020, in the case of flavoring ingredients that are allergens separately determined by the Minister of Food and Drug Safety, they cannot be labeled as flavoring and a specific name must be stated on the package.

Among the flavoring agents, there is a possibility of causing allergies, so they must be separately labeled in Table 2. However, it is limited when it contains more than 0.01% for products washed after use and 0.001% for

products not washed after use. Until 2019, 26 were designated, but from January 1, 2020, hydro xyisohexyl 3 - cyclo hexene carbox aldehyde was banned as a cosmetic ingredient because of the high risk of causing contact dermatitis as a result of risk assessment (Ministry of Government Legislation, 2020a).

**Table 2:** Allergens

| No. | INCI Name | CAS No. | EINECS No. |
|-----|-----------|---------|------------|
| 1 | Amyl Cinnamal | 122-40-7 | 204-541-5 |
| 2 | Benzyl Alcohol | 100-51-6 | 202-859-9 |
| 3 | Cinnamyl Alcohol | 104-54-1 | 203-212-3 |
| 4 | Citral | 5392-40-5 | 226-394-6 |
| 5 | Eugenol | 97-53-0 | 202-589-1 |
| 6 | Hydroxycitronellal | 107-75-5 | 203-518-7 |
| 7 | Isoeugenol | 97-54-1 | 202-590-7 |
| 8 | Amyl Cinnamyl Alcohol | 1101-85-9 | 202-982-8 |
| 9 | Benzyl Salicylate | 118-58-1 | 204-262-9 |
| 10 | Cinnamal | 104-55-2 | 203-213-9 |
| 11 | Coumarin | 91-64-5 | 202-086-7 |
| 12 | Geraniol | 106-24-1 | 203-377-1 |
| 13 | Anise Alcohol | 105-13-5 | 203-273-6 |
| 14 | Benzyl Cinnamate | 103-41-3 | 203-109-3 |
| 15 | Farnesol | 4602-84-0 | 225-004-1 |
| 16 | Butylphenyl Methylpropional | 80-54-6 | 201-289-8 |
| 17 | Linalool | 78-70-6 | 203-375-0 |
| 18 | Benzyl Benzoate | 120-51-4 | 204-402-9 |
| 19 | Citronellol | 106-22-9 | 203-375-0 |
| 20 | Hexyl Cinnamal | 101-86-0 | 202-983-3 |
| 21 | Limonene | 5989-27-5 | 227-813-5 |
| 22 | Methyl 2-Octynoate | 111-12-6 | 203-836-6 |
| 23 | Alpha-Isomethyl Ionone | 127-51-5 | 204-846-6 |
| 24 | Evernia Prunastri Extract | 90028-68-5 | 289-861-3 |
| 25 | Evernia Fufuraces Extract | 90028-67-4 | 289 |

ICI name is an abbreviation of International Nomenclature of Cosmetic Ingredient, and is the name of a cosmetic ingredient listed in the International Cosmetic Ingredient Dictionary (ICID) issued by The Cosmetic, Toiletry and Fragrance Association (CTFA).

CAS No. stands for Chemical Abstracts Service and was created by the American Chemical Society. It is a number that records all known ingredients, substances, etc., and EINECS No. is an abbreviation of European Inventory of Existing Commercial Substance, which is made in Europe and is a number assigned to a chemical substance used commercially.

Ingredients that have been removed during the manufacturing process and do not remain in the final product can be omitted, and if the Minister of Food and Drug Safety acknowledges that there is a risk of infringing profits, it can be labeled as 'other ingredients' (Ministry of Government Legislation, 2020a). Cosmetics are made by combining 20-50 kinds of ingredients. Even if all ingredients are listed, it is difficult for general consumers to understand what purpose the ingredient is used for, what effect it has, or whether it may cause allergies to their skin (Jung, 2008).

### 2.3.2 Cosmetic Expiration Date Notation

In the Cosmetics Act, the term 'expiration date' is defined as the minimum period in which a product can be safely used by consumers while retaining its unique characteristics under proper storage conditions from the date of manufacture. The expiration date or the period of use after opening (if the period of use after opening is indicated, the date of manufacture or the symbol and period as shown in Figure 1 must be indicated in parallel), and the notation method is as shown in Table 3. However, according to Article 19 (3) 4 of the revised Act on March 13, 2020, in the case of customized cosmetics, the name of the cosmetics and the expiration date or the period of use after opening are indicated instead of the mixed subdivision date (Ministry of Government Legislation, 2020b).
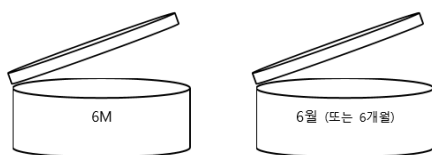


**Figure 1:** Symbol of Use Period after Opening

**Table 3:** Examples of Cosmetic Manufacturing Date and Period of Use Notation

| Contents | Examples of notation method |
|---|---|
| - | Date + manufacturing |
| Manufactured | MFD/MFG/M+date |
| Product date | PROD+date |
| Expiry date | EXP+date |
| Best before end dates | BB/BBE+date |
| Month | Months + m |

### 2.3.3. Cosmetic Storage and Expiration Date

It is best to store cosmetics at around 15℃ in a place that avoids direct sunlight and maintains adequate indoor humidity. This is because cosmetics containing ingredients with low solubility may be affected by temperature, resulting in sediment formation, and the emulsion may be separated and spoiled. In addition, since the main components of cosmetics are water, oil, and surfactant, when exposed to light, heat, and oxygen for a long time, the oil is easily oxidized and is liable to change into lipid peroxide. The expiration date of cosmetics by type is shown in Table 4.

In the case of basic cosmetics and color cosmetics, the expiration date for unopened products is about 30 months (excluding some functional products). The expiration date after opening is recommended for products that come in close contact with the mucous membrane for 6 months, for basic cosmetics 12 months, and for other makeup products for 18 months. Even in the same type of product, the higher the ethanol content is, the longer it is, and the less water it contains, the less proliferation of microorganisms is easy (Ha, 1999).

**Table 4:** General Use Period of Cosmetics by Type

| Contents | Type | Usage period after opening | Expiration date when unopened |
|---|---|---|---|
| Basic cosmetics | Toilet water | 12 months | 30 months (Excluding some functional cosmetics) |
| | Lotion | | |
| | Cream | | |
| | Essence | | |

| Base makeup | Makeup base | 18 months | |
| | Foundation | | |
| Color cosmetics | Eye shadow | 12 months | |
| | Eyeliner | 6 months | |
| | Mascara | | |
| | Lipstick | | |
| Face wash cosmetics | Cleansing foam | 12～18 months | |
| Functional cosmetics | Sunscreen | 6 months | |

### 2.3.4. Cosmetic Usage

When using cosmetics, it is most preferable to use a cosmetic cotton pad, spatula, etc., and use a small amount of the amount to be used once. According to Kim and Lim (2009), in the case of cream, when used by hand, general bacteria and E. coli were detected, and bacteria were detected up to 205 times higher than that of cream using spatula. Even if you wash your hands before use, the number of microorganisms increased (Kim & Lim, 2009). Therefore, microbial propagation and other skin troubles can be reduced by minimizing direct contact of the skin to the cosmetic surface using tools.

### 2.3.5. Precautions for Use

The precautions for common use should be described as when using cosmetics or after use, when the area to be used has abnormal symptoms or side effects such as red spots, swelling or itching due to direct sunlight. This should be consulted with a specialist, and should be kept out of reach of children and kept out of direct sunlight. Other cosmetics should be individually described for each characteristic. One of them is that scrub cleansers containing fine particles should be washed with water when particles get into the eyes, consult a specialist in case of abnormalities, and mask packs should be used avoiding the eye area (Ministry of Government Legislation, 2020a).

## 2.4. Cosmetic Information

### 2.4.1. The Path of Cosmetic Information

Consumers are directly or indirectly influenced by purchases because many kinds of advertisements and daily life are closely connected in a highly information-oriented society. Due to the popularization of smartphones, more information is sometimes obtained through Social Network Services/sites (SNS), mainly through "YouTube" or "Instagram", rather than commercial advertisements using the mass media. SNS is possible in real time from advertisements to product information and product payments. VLOG, which is popular on the internet recently, is a compound word of video and blog, which refers to recording one's daily life as a video (Vlog, 2020). Algorithms that constantly recommend videos related to the content that you enjoy watching usually stimulate your desire to purchase.

### 2.4.2. The Path of Cosmetic Safety Information

In Korea, the website of the Korea Cosmetics Association provides common sense of cosmetics and other related information for consumers. Consumers can check the latest information on cosmetics through the website. In addition, cosmetics-related apps such as 'Reconciliation' and 'Glow Pick' display all the ingredients of the product, 20 ingredients to be careful, and ingredients that can cause allergies. It is displayed for easy viewing. Through such information, consumers can easily grasp the safety of the cosmetics they want to purchase or the cosmetics they are using, even if they have little professional knowledge about cosmetics. In addition, the tendency of consumers to purchase cosmetics while collecting various information using online environments such as the Internet and smartphones is steadily increasing (Lee et al., 2020).

## 3. Research Contents and Method

## 3.1. Research Issues

The research problems of this study are as follows. First, examine the general characteristics of the survey subjects. Second, it examines the perception of cosmetic information. Third, examine the difference in safety perception according to cosmetic information.

## 3.2. Research Subject and Data Collection

This study used an online self-filled questionnaire using "Naver Form" for female consumers in their twenties residing in the metropolitan area. The survey period was conducted from May 1, 2020 to May 20, 2020, and among 324 people submitted, 308 questionnaires excluding 16

unfaithful responses were selected and analyzed as final data.

## 3.3. Composition of Measuring Tools

For the purpose of this study, we analyzed the perception and use of cosmetics on the expiration date and safety of women in their twenties. To this end, the questionnaire used in previous studies, Shin (2012), a study on consumer perception and use of cosmetics safety (Shin, 2012), a study on awareness of expiration date and interest in safety information (Im, 2010). The study consisted of a total of 44 questions, including 7 questions on the general characteristics of the survey subjects, 12 questions on awareness of cosmetic information, and 25 questions on differences in perception of cosmetic use safety.

## 3.4. Data Analysis Method

The data collected in this study were analyzed using the SPSS (Statistical package for the social science) 22.0 program. Using the analysis method, frequency analysis and percentage were calculated for the general characteristics of the study subjects, and the Likert 5-point scale (1=not at all, 2=not, 3=normal, 4=yes, 5=very yes) to measure the degree of recognition according to cosmetic information, was used. In addition, factor analysis, reliability analysis, and variance analysis were conducted using the varimax rotation method to find out the difference in safety perception according to cosmetic information.

## 4. Research Results

## 4.1. General Characteristics of Study Subjects

In the results of general characteristics analysis of the study subjects, the age of 23-25 years (4.8%) and the final academic background were college enrollment (62.3%), and unmarried was 95.1% and married 4.9%. The occupations were students (67.9%), office workers (10.4%), and the order of residence was Gyeonggi-do 39.3%, Incheon 38.3%, and Seoul 22.4%. In terms of monthly average income, 'less than 300,000 won' accounted for 31.2%, followed by '30 to 500,000 won' 18.5%, '1 to 2 million won' 15.6%, '2 to 3 million won' 11.7%, '500,000 to 700,000 won' 11.4 %, 5.8% of '0.7～1 million won', and 5.7% of '3 million won or more' in Table 5.

**Table 5.** General Characteristics of Research Subjects

| Division | | Number | Percentage (%) |
|---|---|---|---|
| Age | 20～22 years old | 125 | 40.6 |
| | 23～25 years old | 138 | 44.8 |
| | 26～29 years old | 45 | 14.6 |
| Education | High school graduation | 41 | 13.3 |
| | Attending university | 174 | 62.3 |
| | University graduation | 75 | 19.5 |
| | Graduate school | 9 | 2.9 |
| | Graduate graduation | 6 | 1.9 |
| Marital status | Married | 15 | 4.9 |
| | Single | 293 | 95.1 |
| Occupation | Student | 209 | 67.9 |
| | Sales/Service | 16 | 5.2 |
| | Profession | 20 | 6.5 |
| | Self-employment | 4 | 1.3 |
| | White collar | 32 | 10.4 |
| | Official | 3 | 1.0 |
| | Official | 4 | 1.3 |
| | Technical | 2 | 0.6 |
| | Etc. | 18 | 5.7 |
| Residence | Gyeonggi-do | 121 | 39.3 |
| | Seoul | 69 | 22.4 |
| | Incheon | 118 | 38.3 |
| Average monthly income | less than 300,000won | 96 | 31.2 |
| | 300,000-500,000 won | 57 | 18.5 |
| | 500,000 to 700,000 won | 35 | 11.4 |
| | 500,000 to 700,000 won | 18 | 5.8 |
| | 1 to 2 million won | 48 | 15.6 |
| | 2 to 3 million won | 36 | 11.7 |
| | 3 million won or more | 18 | 5.7 |
| Total | | 308 | 100.0 |

## 4.2. Validity and Reliability Analysis Results for

## Cosmetic Information Factors

As a result of Bartlett's sphericity test, X2=1203.552 (df=66, sig=-0.000), confirming the suitability of the factor analysis model (Kaiser, 1974). The factors were extracted by the main component method and rotated by the varimax method to derive 5 sub-factors with a high value of 1 or more in Table 6. The load of the derived factors is 0.5 or more, and the total explanatory power of the six derived factors is 75.316%, and the Cronbach alpha value of each factor is generally considered a desirable value when the reliability value is 0.8-0.9 or more, and 0.6-0.7 is acceptable. It is judged to be good enough.

**Table 6.** Validity and Reliability of Factors of Cosmetic Information

| Item variable name | Cosmetic information factor | | | | | Cronbach's α |
|---|---|---|---|---|---|---|
| | Produce Date | Information | Attention | Knowledge | Function | |
| Buying | 0.952 | | | | | |
| Use after checking the date of manufacture of cosmetics. | 0.944 | | | | | 0.92 |
| Trust the information provided by the cosmetics salesperson. | | 0.774 | | | | |
| Trust in the effectiveness of cosmetics advertising. | | 0.740 | | | | 0.6 |
| Trust the information provided on the Internet. | | 0.738 | | | | |
| I tend to buy new makeup products. | | | 0.872 | | | |
| Watch makeup-related videos regularly. | | | 0.796 | | | 0.74 |
| I tell others about the cosmetic knowledge I learned. | | | | 0.794 | | |
| When buying cosmetics, I tend to refer to the opinions of people around me. | | | | 0.739 | | 0.66 |
| Because of me, people around me buy new products. | | | | 0.498 | 0.631 | |
| I know how to use the cosmetics I use. | | | | | 0.842 | |
| I am well aware of the effects of the cosmetics I use. | | | | | 0.836 | 0.7 |

## 4.3. Awareness of Cosmetic Information

The analysis results for the manufacturing date of the cosmetics in factor 1 were in the order of 'use after checking the manufacturing date' (M=2.91), and 'purchase after confirming the manufacturing date' (M=2.82). As a result of measuring the awareness of cosmetic information in factor 2, 'information provided by cosmetics salespersons' (M=3.02) was the highest, followed by 'information provided on the Internet' (M=3.03), and 'cosmetic advertising effect' (M=2.61). appear. As a result of measuring the perception of cosmetics interest in factor 3, it was found in the order of 'watching makeup-related videos' (M=2.82), and 'buying new products' (M=2.00). As a result of measuring the perception of cosmetics knowledge in factor 4, 'Refer to acquaintance's opinion when 'purchasing cosmetics' (M=3.75), 'Transfer cosmetics knowledge to others' (M=3.57), 'Purchase products by others with their own recommendation' (M =3.23).

As a result of measuring the perception of cosmetic performance of factor 5, it was found in the order of 'how to use' (M=3.59) and 'effect' (M=3.27) in Table 7. These results are similar to those of Shon et al. (2019) that the

cosmetic recommendation intention has a significant positive (+) effect on cosmetic information search. However, the overall reliability of cosmetic information was 3.05 out of 5 points, indicating that the average was low, so it is necessary to prepare a systematic plan for obtaining and delivering cosmetic information.

4. Differences in Safety Perception When Used according to Cosmetic Information

In factor 1, it was confirmed that there was a significant difference in safety perception for 'use period after opening' ($p<.001$) and 'trouble-causing substances' ($p<.01$) when there was awareness of the cosmetic manufacturing date. In factor 2, if there is awareness of cosmetic information, 'the period of use after opening' ($p<.001$), 'How to properly store cosmetics' ($p<.001$), 'Hazardous ingredients in cosmetics to avoid' ($p<.05$). It was confirmed that there was a significant difference in safety perception for 'trouble-causing ingredients' ($p<.01$).

In factor 4, when there is a perception of knowledge related to cosmetics, it was confirmed that there was a significant difference in cosmetic safety perception in items such as 'use period after opening' ($p<0.001$) and 'trouble causing ingredients' ($p<0.01$). In factor 5, the difference in safety perception of cosmetic performance was not statistically significant in Table 8. In a study by Shin (2012). It was statistically significant that female graduate-graduate consumers checked cosmetic ingredients, and college-graduated consumers did not check the ingredients ($p<0.05$) (Shin, 2012).

In a study on the recognition of all ingredients labeling for cosmetics by Kim (2019) for high school students, despite the fact that all ingredients labeling for cosmetics is a system for consumers' right to know, it is not useful for high school students due to difficulties in understanding the ingredients. There are reports (Kim, 2019).
This suggests that there is a need to provide cosmetic ingredient information in a schematic or simplified manner so that it can be easily understood.

**Table 9.** Differences in Safety Perception according to Cosmetic Information

| Factor | Safety awareness | Recognition | N | Mean | ±SD | F | p-value |
|---|---|---|---|---|---|---|---|
| 1. Produce Date | Usage period after opening | Yes | 43 | 3.64 | ±1.0874 | 11.853** | 0.000 |
| | | No | 78 | 2.699 | ±1.1059 | | |
| | | Not sure | 185 | 2.754 | ±1.1482 | | |
| | Ingredients that deteriorate well | Yes | 43 | 2.891 | ±0.8751 | 0.002 | 0.998 |
| | | No | 78 | 2.897 | ±0.6363 | | |
| | | Not sure | 185 | 2.892 | ±0.6448 | | |
| | The way to properly store cosmetics | Yes | 43 | 2.674 | ±0.9752 | 1.833 | 0.162 |
| | | No | 78 | 2.308 | ±1.0264 | | |
| | | Not sure | 185 | 2.397 | ±1.0349 | | |
| | Harmful ingredients in cosmetics to avoid | Yes | 43 | 3.55 | ±0.7694 | 0.643 | 0.526 |
| | | No | 78 | 3.432 | ±0.629 | | |
| | | Not sure | 185 | 3.539 | ±0.7707 | | |
| | Ingredients that cause trouble | Yes | 43 | 3.756 | ±0.7971 | 4.699* | 0.010 |
| | | No | 78 | 3.378 | ±0.6405 | | |
| | | Not sure | 185 | 3.378 | ±0.7785 | | |
| 2. Information | Usage period after opening | Yes | 37 | 3.581 | ±0.9755 | 8.314*** | 0.000 |
| | | No | 103 | 2.748 | ±1.1544 | | |
| | | Not sure | 166 | 2.777 | ±1.1671 | | |
| | Ingredients that deteriorate well | Yes | 37 | 3.063 | ±0.8672 | 1.49 | 0.227 |
| | | No | 103 | 2.97 | ±0.6047 | | |
| | | Not sure | 166 | 2.851 | ±0.6702 | | |
| | The way to properly store cosmetics | Yes | 37 | 3.162 | ±1.0869 | 13.227*** | 0.000 |
| | | No | 103 | 2.194 | ±0.9054 | | |
| | | Not sure | 166 | 2.383 | ±1.0149 | | |
| | Harmful ingredients in cosmetics to avoid | Yes | 37 | 3.82 | ±0.6166 | 4.177* | 0.016 |
| | | No | 103 | 3.417 | ±0.6934 | | |
| | | Not sure | 166 | 3.504 | ±0.7713 | | |
| | Ingredients that | Yes | 37 | 3.797 | ±0.6918 | 6.161** | 0.002 |

| Category | Item | Answer | N | Mean±SD | F | p |
|---|---|---|---|---|---|---|
| | cause trouble | No | 103 | 3.466±0.6578 | | |
| | | Not sure | 166 | 3.328±0.8047 | | |
| 3. Attention | Usage period after opening | Yes | 98 | 3.153±1.1586 | 4.587* | 0.011 |
| | | No | 62 | 2.677±1.1166 | | |
| | | Not sure | 146 | 2.75±1.1689 | | |
| | Ingredients that deteriorate well | Yes | 98 | 2.918±0.6685 | 0.099 | 0.906 |
| | | No | 62 | 2.882±0.6503 | | |
| | | Not sure | 146 | 2.881±0.6978 | | |
| | The way to properly store cosmetics | Yes | 98 | 2.765±1.0581 | 9.552*** | 0.000 |
| | | No | 62 | 2.129±0.896 | | |
| | | Not sure | 146 | 2.298±1.001 | | |
| | Harmful ingredients in cosmetics to avoid | Yes | 98 | 3.68±0.6682 | 5.309** | 0.005 |
| | | No | 62 | 3.301±0.7652 | | |
| | | Not sure | 146 | 3.491±0.7461 | | |
| | Ingredients that cause trouble | Yes | 98 | 3.709±0.6846 | 10.326*** | 0.000 |
| | | No | 62 | 3.323±0.6781 | | |
| | | Not sure | 146 | 3.291±0.7895 | | |
| 4. Knowledge | Usage period after opening | Yes | 39 | 3.577±1.1329 | 8.913*** | 0.000 |
| | | No | 83 | 2.699±1.0986 | | |
| | | Not sure | 184 | 2.788±1.1588 | | |
| | Ingredients that deteriorate well | Yes | 39 | 2.675±0.6188 | 2.343 | 0.098 |
| | | No | 83 | 2.932±0.7057 | | |
| | | Not sure | 184 | 2.922±0.6707 | | |
| | The way to properly store cosmetics | Yes | 39 | 2.577±0.9702 | 0.604 | 0.548 |
| | | No | 83 | 2.416±1.0529 | | |
| | | Not sure | 184 | 2.378±1.0296 | | |
| | Harmful ingredients in cosmetics to avoid | Yes | 39 | 3.359±0.7066 | 1.301 | 0.274 |
| | | No | 83 | 3.482±0.6832 | | |
| | | Not sure | 184 | 3.56±0.7635 | | |
| | Ingredients that cause trouble | Yes | 39 | 3.821±0.6334 | 6.134** | 0.002 |
| | | No | 83 | 3.355±0.7179 | | |
| | | Not sure | 184 | 3.383±0.7779 | | |
| 5. Function | Usage period after opening | Yes | 2 | 3±1.4142 | 0.5 | 0.607 |
| | | No | 112 | 2.777±1.189 | | |
| | | Not sure | 192 | 2.914±1.1585 | | |
| | Ingredients that deteriorate well | Yes | 2 | 2.833±0.7071 | 0.046 | 0.955 |
| | | No | 112 | 2.908±0.6073 | | |
| | | Not sure | 192 | 2.885±0.7176 | | |
| | The way to properly store cosmetics | Yes | 2 | 2.75±1.7678 | 0.488 | 0.614 |
| | | No | 112 | 2.344±0.9956 | | |
| | | Not sure | 192 | 2.451±1.043 | | |
| | Harmful ingredients in cosmetics to avoid | Yes | 2 | 3.667±0.4714 | 0.328 | 0.72 |
| | | No | 112 | 3.47±0.6867 | | |
| | | Not sure | 192 | 3.536±0.7672 | | |
| | Ingredients that cause trouble | Yes | 2 | 3.5±0.7071 | 0.345 | 0.709 |
| | | No | 112 | 3.478±0.7083 | | |
| | | Not sure | 192 | 3.404±0.7876 | | |

*p<0.05, **p<0.01, ***p<0.001

# 5. Conclusions

This study is a study on the difference in awareness of cosmetics information and safety when using cosmetics in order to understand the level of awareness of use safety according to cosmetics information of women in their

twenties living in the metropolitan area. The results are as follows. First, as a result of measuring the awareness of the five factors for cosmetic information, the recognition of "cosmetic-related knowledge" (M=3.52) and "cosmetic performance" (M=3.43) was high. It can be seen that the sharing of cosmetic knowledge information is actively carried out with each other, and that the method of use and effect are properly recognized and cosmetic products are selected. Therefore, when launching a new cosmetic product, it is necessary to emphasize information on this part.

Second, as a result of analyzing the difference in safety perception of five factors according to cosmetic-related information, it was found that there was a statistically significant difference in all four factors except for the factors related to cosmetic performance in the 'use period after opening'. There was a significant difference in the factors of interest in cosmetics in 'correct cosmetics storage method' ($p<.001$), and the factors of cosmetics information ($p<0.05$) and factors of interest in cosmetics ($p<0.01$) in 'Hazardous ingredients in cosmetics to avoid'. There was a significant difference in 'Trouble-causing ingredients' showed a statistically significant difference in safety perception in all factors except cosmetic performance factors.

This study confirmed that women in the metropolitan area in their twenties had differences in safety perception according to cosmetic information. Therefore, when consumers purchase cosmetics, there is a need to construct a system that allows consumers to easily purchase cosmetics that are necessary for their skin by schematically or simplifying the information on the period of use and trouble-causing ingredients after opening the cosmetics to be easily understood. Further, in future studies, as the number of male consumers called Grooming is increasing, there is a need to expand gender and region. In order to revitalize the customized cosmetics market, a systematic study should be conducted to raise awareness of the actual condition of cosmetics use and safety in changed periods.

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