

# Protection Convergence

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Corresponding author\*  
E-mail: cjs7470@hanmail.net

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## The Influence Relationship between College Students' Self-Esteem, Appearance Satisfaction, and Beauty Interest for Protection and Convergence

Minjun Jang<sup>1</sup>

*Yewon Arts University, Yangju, Republic of Korea*

Jungsoon Choi<sup>2\*</sup>

*Yewon Arts University, Yangju, Republic of Korea*

Jiyoung Seo<sup>3</sup>

*Yewon Arts University, Yangju, Republic of Korea*

### Abstract

**Purpose:** In the contemporary world, where personal values and standards of living are on the rise, appearance is not only an important means of self-expression, but also plays a central role in the formation and expression of the self. By being satisfied with one's appearance, one can fulfill the outer and inner beauty of the body, thereby increasing self-esteem and maintaining good interpersonal relationships and positive social behavior in social life. With the increasing importance of appearance in modern society, interest in beauty is also increasing. The objective of this study is to investigate the relationship between self-esteem, appearance satisfaction, and beauty interest among college students.

**Method:** Questionnaires were distributed offline to college students at four-year universities in Gyeonggi-do for about one month from September to October 2023 and analyzed using the SPSS V.27.0 statistical package program to investigate the relationship between self-esteem, appearance satisfaction, and beauty interest. Stepwise multiple regression analysis was used to examine the relationship between self-esteem, appearance satisfaction and beauty interest.

**Results:** First, the results of the analysis of the effect of self-esteem on appearance satisfaction showed that self-esteem had a significant effect on two sub-dimensions of appearance satisfaction: appearance confidence and appearance anxiety. Second, the effect of self-esteem on beauty interest was analyzed, and it was found that positive self-esteem and negative self-esteem had a significant effect on the sub-factor of beauty interest, fashion interest. Third, the results of the analysis of the effect of appearance satisfaction on beauty interest showed that self-control interest and others' fashion interest are influenced by appearance satisfaction and have a defining effect on appearance self-confidence and appearance anxiety.

**Conclusion:** The expansion of the beauty industry has given rise to the emergence of numerous beauty-related fields, which has resulted in a surge in various forms of consumption. It is our contention that multidisciplinary research should be conducted on various generations of consumers in the beauty industry, and we anticipate contributing to further research on beauty interest.

**Keywords:** College Student, Self-Esteem, Appearance Satisfaction, Protection Convergence, Beauty Interest

## 1. Introduction

As the value and standard of living of individuals increase, we are living in an era where self-image and appearance are important. Being beautiful, healthy, attractive, and unique is a competitive advantage[1].

Modern people are more competitive than ever, and they want to look good. Choi EJ found

that people who are psychologically exhausted are more willing to spend money on beauty treatments because they feel they have to make up for their lack of energy [2].

A 2020 survey of 372 employers on the job recruitment platform People-In revealed that more than half (55.6%) of them admitted that a candidate's appearance influences their hiring decisions. In particular, they highlighted mood, including facial expressions, cleanliness, dress, body type, hair, and makeup. 47.2% of responding organizations stated that they had rejected a candidate based on their appearance, and one in three said they had passed over a candidate because of their appearance, even if they lacked some of the specifications or skills. A 2015 Gallup Korea survey of 1,500 men and women aged 19 and over nationwide revealed that over 80% of respondents considered their appearance to be important in their lives, while 14% stated that it was not.

In contemporary society, physical appearance is a significant means of self-expression, playing a pivotal role in the formation and expression of one's self-concept [3], and body image satisfaction can serve as a means of enhancing self-esteem by satisfying the external and internal beauty of one's body. It is also a means of maintaining positive interpersonal relationships in social life and maintaining good social behavior [4].

In addition to concerns about one's physical appearance, self-esteem also plays a role in the development of a positive external image. High satisfaction with one's body has a positive impact on self-esteem, and conversely, high self-esteem increases body satisfaction. A person with high self-esteem is likely to believe that every situation is worthwhile and rewarding. This positive outlook is reflected in their actions, which are characterized by confidence. Consequently, they enjoy a positive social life and are enterprising and energetic in their daily lives. In contrast, a person with low self-esteem tends to believe that they are worthless, useless and weak. This negative self-perception can lead to self-abuse and the development of inferiority complexes. From this perspective, appearance also affects self-esteem and is closely related to society.

The study by Kim YR, Nam MW examined the impact of beauty interest factors on stress among female college students [5]. The findings revealed that the stress levels of the beauty interest group differed significantly from those of the control group in terms of peer stress, opposite sex stress, and employment stress. In another study, Jung JW investigated the relationship between appearance satisfaction and eye makeup interest and makeup care behavior among female consumers [6]. The results indicated that higher levels of appearance satisfaction were associated with higher levels of eye makeup interest. In a study on women's perceptions of beauty care after the Covid-19 pandemic, Lee HJ, Lee JB, Kim HW found that Korean women's perceptions of beauty care are undergoing a transformation, with purchases being made in a rational manner contingent on the circumstances [7].

The beauty industry in Korea is triggering a global syndrome, which is providing direction as a new growth engine for K-beauty [8]. This field is sufficiently developed to become a global beauty industry [9]. The objective of this study is to investigate the relationship between self-esteem, appearance satisfaction, and beauty interest among college students. This study will help to understand the beauty behavior of college students and to investigate consumer trends.

## 2. Theoretical Background

### 2.1. Self-esteem

Self-esteem is an attitude of confidence in one's abilities and the ability to recognize the worthiness of one's existence [10], and is generally defined as a subjective evaluation of oneself and a positive or negative attitude toward oneself. It refers to the degree of self-respect and the degree to which one considers oneself to be a worthy person, and high self-esteem means

that one considers oneself to be a worthy human being[11].

Self-esteem is defined as the evaluation an individual forms and maintains of themselves, expressed in positive or negative attitudes. It encompasses the extent to which an individual feels important, competent, successful, and valuable[12].

Yoo DR described self-esteem as the degree of self-respect and the degree to which one considers oneself a worthy person, and that having high self-esteem means that one feels oneself to be a worthy human being[13].

Women may engage in a range of grooming practices to maintain a slim, youthful appearance. The pursuit of an ideal appearance may serve as a means of enhancing self-esteem, and observed differences in self-esteem may manifest as differences in grooming behaviors[14].

It has been demonstrated that individuals tend to enhance their satisfaction with themselves and their self-esteem through various grooming practices aimed at overcoming body image complexes. Furthermore, higher self-esteem is associated with more positive attitudes toward oneself through active grooming[15]. Additionally, positive self-esteem exerts a positive influence on the active adoption of new trends, which in turn contributes to the creation of a more extreme self-image[16].

## **2.2. Appearance satisfaction**

The dictionary definition of appearance is the outward appearance or appearance of a person. While the concept was previously limited to the face, it can now be said to include the entire body[17].

Given that perceptions of appearance are often based on subjective judgments rather than objective measures, this can be explained by social comparison theory. This theory posits that in the absence of objective evaluation criteria, individuals form evaluations of themselves by comparing themselves to others. This process is directly related to perceptions of appearance, self-esteem, and appearance management behaviors[18].

In the contemporary era, the significance of physical appearance has undergone a transformation across various domains, driven by rising standards of living and social change. Modern individuals devote a considerable amount of time and resources to enhancing their outward appearance, driven by a combination of self-satisfaction and the desire to improve their physical appearance. This interest in appearance has expanded to encompass a diverse range of practices, including makeup, nail art, hair, skin care, fashion, and more[19].

Those who possess an ideal appearance tend to exhibit positive self-perceptions, a proactive demeanor, and enhanced confidence in their abilities and social interactions[20].

## **2.3. Beauty interest**

The dictionary definition of beauty is a quality that is inherently beautiful, excellent, and worthy of admiration. It is often associated with positive emotions and experiences, particularly those that are visually and aurally pleasing. In general, the terms beauty and grooming are used interchangeably. The latter is defined in the dictionary as the beautiful adornment of the face or hair[21]. Like fashion, it is a component of a person's outward appearance[22].

The term beauty interest is derived from the broader concept of appearance interest. It encompasses interest in the beauty industry, which encompasses a range of products and services related to skin care, hair care, nail care, makeup, and other aspects of appearance. This interest can extend to the application of beauty products and practices to enhance one's appearance[23].

Appearance is a means of self-expression that is influenced by a person's physical attributes,

facial features, clothing, cosmetics, and other grooming practices[24]. As living standards rise, individuals of all ages are becoming increasingly preoccupied with their appearance[25].

Han KH, Park JY, Choi EJ said that beauty care behavior is an important factor that enhances consumers' emotions and stimulates individual beauty care behavior[26].

Appearance management is the process of presenting one's identity to others in a social context and encompasses all of an individual's appearance-related concerns, choices, and behaviors, as well as all of the behaviors, thought processes, and body modifications that lead to the purchase and wearing of clothing[27].

Regardless of age, interest in appearance is growing, and various consumer behaviors are leading to appearance management behaviors[28]. Appearance management behavior has shifted from the role of 'appearance' as a medium for others to perceive and accept the self in a positive image, to more active and diverse behaviors to achieve an ideal appearance[29].

In the modern world, people are increasingly concerned about their appearance, and students are no exception. Depending on the social environment, we learn to recognize ourselves and others through dialogue with others and receive more social influences.

### 3. Research Method

#### 3.1. Study population and duration

This study was conducted to investigate the relationship between self-esteem, appearance satisfaction and beauty interest among college students. The sample used in the study was obtained through a self-report survey. 250 questionnaires were distributed to four-year universities in Gyeonggi-do for about one month from September to October 2023, and 250 copies were returned. Finally, 245 questionnaires were selected as the valid sample after excluding non-responses or refusals. The sample consisted of 192 women (78.4%) and 53 men (21.6%), with 109 (44.5%) in the third year, 56 (22.9%) in the 32nd year, 52 (21.2%) in the fourth year and 28 (11.4%) in the first year. A total of 471 multiple responses were received for beauty interests, of which 116 (24.6%) were interested in make-up, followed by 115 (24.4%) for skin, 98 (20.8%) for health and fitness, 59 (12.5%) for nails, 42 (8.9%) for hair and 41 (8.7%) for plastic surgery. In terms of average monthly beauty spend, 92 respondents (37.6%) spent less than 30,000 won, 55 respondents (22.4%) spent more than 30,000 won but less than 50,000 won, 38 respondents (15.5%) spent more than 100,000 won, 34 respondents (13.9%) spent more than 50,000 won but less than 70,000 won and 26 respondents (10.6%) spent more than 70,000 won but less than 100,000 won.

This study used a questionnaire by Kim JH, Kim, KH, Lee YJ, Jung CJ, Hong SN, Kim HS which was modified and supplemented by the researcher to suit the purpose of the study[30][31][32].

The questionnaire consisted of 40 questions, including 4 questions on general characteristics, 12 questions on self-esteem, 12 questions on appearance satisfaction, and 12 questions on beauty interest.

Self-esteem, appearance satisfaction and beauty interest were measured using a 5-point Likert scale (1: strongly disagree, 5: strongly agree).

The statistical processing of the data collected through the data analysis method was carried out through the processes of data coding and data cleaning, and analyzed using SPSS 27.0. Specifically, the general characteristics, self-esteem, appearance satisfaction, and beauty interest of the subjects were examined through frequency analysis.

Factor analysis was used to check the validity of the measurement instrument, Cronbach's  $\alpha$  coefficient was calculated to check reliability, and a t-test and one-way ANOVA were used to check beauty interest.

### 3.2. Research questions

<Research question 1> College students' self-esteem will affect their appearance satisfaction.

1-1. College students' positive self-esteem will have a positive effect on appearance confidence.

1-2. College students' negative self-esteem will have a negative effect on appearance confidence.

1-3. College students' positive self-esteem will have a negative effect on appearance anxiety.

1-4. College students' negative self-esteem will have positive effect on appearance anxiety.

<Research question 2> College students' self-esteem will affect their beauty interest.

2-1. College students' positive self-esteem will have a positive effect on self-directed interest.

2-2. College students' negative self-esteem will have a positive effect on self-directed interest.

2-3. College students' positive self-esteem will have a positive effect on others trend interest.

2-4. College students' negative self-esteem will have a positive effect on others trend interest.

<Research question 3> College students' appearance satisfaction will affect their beauty interest.

3-1. College students' appearance confidence will have a positive effect on self-directed interest.

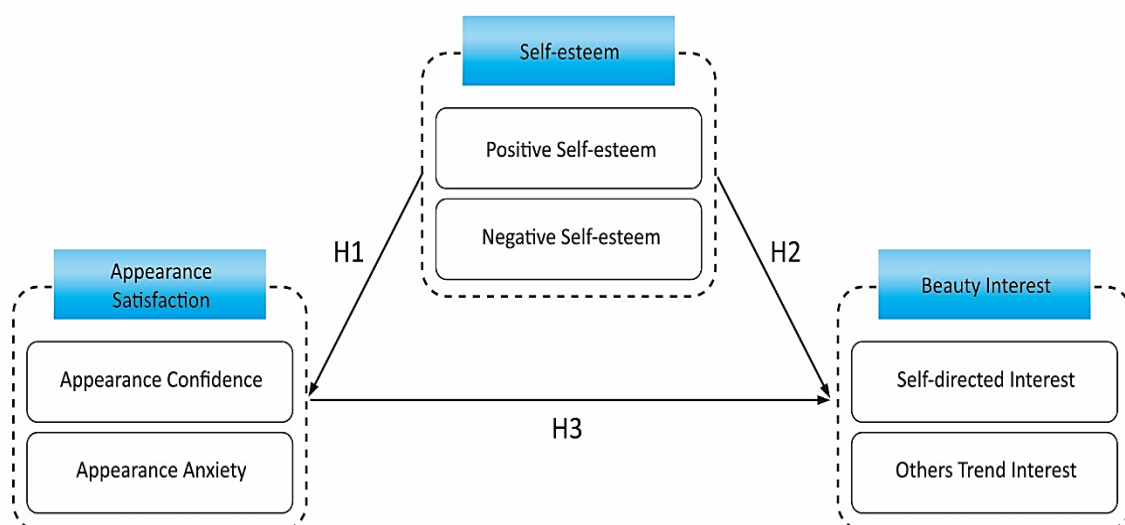
3-2. College students' appearance anxiety will have a positive effect on self-directed interest.

3-3. College students' appearance confidence will have a positive effect on others trend interest.

3-4. College students' appearance anxiety will have a positive effect on others trend interest.

The research model is shown in < Figure 1>.

**Figure 1.** Research model.



## 4. Research Results

### 4.1. Reliability and validity verification

SPSS 27.0 was used for statistical analysis and hypothesis testing. The model of this study shows the relationship between self-esteem (positive self-esteem, negative self-esteem), appearance satisfaction (appearance confidence, appearance anxiety) and beauty interest (self-directed interest, others trend interest).

An exploratory factor analysis was conducted using SPSS 27.0, and some items (3 items for self-esteem, 4 items for appearance satisfaction, and 7 items for beauty interest) were removed through reliability analysis and scale cleaning. All measured variables were subjected to principal component analysis to extract the components, and orthogonal rotation was used to simplify the factor loadings. Factor loadings of 0.5 or more were considered significant.

As a result of the factor analysis, the independent, mediator and dependent variables were grouped into two factors, each with eigenvalues greater than one. The cumulative explanation rate of the independent variable, self-esteem, was 73.695%, the overall reliability coefficient was 0.875 and the factor reliability coefficient was greater than 0.884. The cumulative explanation rate of the parameter appearance satisfaction was 77.506%, the overall reliability coefficient was 0.918, and the factor reliability coefficient was greater than 0.808. The cumulative explanation rate of the dependent variable, beauty interest, was 76.854%, the overall reliability coefficient was 0.856, and the factor reliability coefficient was greater than 0.788.

The results of each factor analysis are shown in <Table 1>, <Table 2> and <Table 3>.

**Table 1.** Factor analysis results for self-esteem variables.

Questions	Name of factor		Commonality
	Negative	Positive	
I'm worried about how I look to others	.851	-.240	.781
I have a great body	.790	-.259	.692
I don't like the way I look	.781	-.373	.750
I am ashamed of my appearance	.751	-.205	.606
I have a lot of things I need to change about my appearance	.744	-.253	.618
I like the way I look	-.195	.871	.796
I look as good as I want to look	-.307	.870	.850
I am as good looking as other people	-.329	.829	.795
I am proud of my appearance	-.300	.809	.744
Eigenvalue	3.406	3.226	
Dispersion (%)	37.847	35.848	
Cumulative (%)	37.847	73.695	
Individual reliability (Cronbach's $\alpha$ )	.884	.913	
Overall reliability	.875		
KMO and Bartlett's sphericity test	KMO=.869 $\chi^2=1,572.245$ $p<.000$		

**Table 2.** Factor analysis results for appearance satisfaction variables.

Questions	Name of factor		Commonality
	Appearance	Appearance	
I can accomplish things as well as others	.885	-.269	.855
I am generally satisfied with myself	.872	-.203	.802
I think I am a worthy person	.850	-.213	.768
I have a lot of good points	.845	-.287	.796
I feel okay about myself	.812	-.340	.775
In general, no one cares about me	-.119	.859	.752
I have nothing to be proud of	-.393	.781	.764
I am a failure in general	-.296	.775	.688
Eigenvalue	3.895	2.305	
Dispersion (%)	48.693	28.812	
Cumulative (%)	48.693	77.506	
Individual reliability (Cronbach's $\alpha$ )	.936	.808	
Overall reliability	.918		
KMO and Bartlett's sphericity test	KMO=.883 $\chi^2=1,422.049$ $p<.000$		

**Table 3.** Factor analysis results for beauty interest variables.

Questions	Name of factor		Commonality
	Self-directed	Others trend	
I know the different brands of cosmetics	.885	.207	.826
I know what makeup looks good on me	.797	.323	.740
I find it fun to do my makeup and hair	.668	.428	.629
I often imitate celebrity beauty styles	.240	.891	.851
I buy makeup and hair accessories that are currently on trend	.381	.808	.798
Eigenvalue	2.067	1.776	
Dispersion (%)	41.335	35.520	
Cumulative (%)	41.335	76.854	
Individual reliability (Cronbach's $\alpha$ )	.804	.788	
Overall reliability	.856		
KMO and Bartlett's sphericity test	KMO=.826 $\chi^2=522.032$ $p<.000$		

## 4.2. Correlation analysis

The results of the descriptive statistics analysis showed that the mean scores of positive self-esteem, appearance confidence and self-directed interest were above 3, but the mean scores of negative self-esteem, appearance anxiety and other trend interests were all below 3. The correlation analysis showed that the correlations between the factors with mean scores above

3 were all significantly positive, and the correlations between the factors with mean scores below 3 were also significantly positive. However, the correlations between the factors with mean scores above 3 and the factors with mean scores below 3 were all significantly negative, except for the relationship with the dependent variable. Among the independent variables, self-esteem, and the dependent variable, interest in beauty, there was no statistically significant correlation. There was no statistically significant correlation between appearance anxiety among the mediating variables, appearance satisfaction, and self-subjective interest among the dependent variables, beauty interest. The results of the correlation analysis are presented in <Table 4>.

**Table 4.** Results of the correlation analysis.

	Correlation analysis						
	Mean	Standard deviation	1	2	3	4	5
1. Positive self esteem	3.737	0.880	1				
2. Negative self esteem	2.276	0.933	-.604***	1			
5. Appearance confidence	3.207	0.944	.623***	-.519***	1		
6. Appearance anxiety	2.673	0.955	-.396***	.551***	-.577***	1	
3. Self-directed interest	3.210	1.053	.196**	-.162*	.287***	.053	1
4. Others trend interest	2.233	1.234	.116	.053	.133*	.280***	.660***

Note: \* p<.05, \*\* p<.01, \*\*\* p<.001.

### 4.3. Hypothesis verification

In this study, multiple regression analysis was conducted to test hypothesis 1, hypothesis 2 and hypothesis 3. Multiple regression analysis was conducted to examine the effect of college students' self-esteem on appearance satisfaction, and the results of the analysis are shown in <Table 5>. The results of the analysis showed that positive self-esteem (B=0.523,  $\beta$ =.487, t=7.929, p<.001) had a positive and significant effect on appearance satisfaction, and negative self-esteem (B=-0.227,  $\beta$ =-.224, t=-3.642, p<.001) had a negative and significant effect on appearance satisfaction, so hypotheses 1-1 and 1-2 were accepted. Positive self-esteem (B=-0.107,  $\beta$ =-.099, t=-1.472, p>.05) did not have a statistically significant effect on appearance anxiety, but negative self-esteem (B=0.503,  $\beta$ =.491, t=7.330, p<.001) had a positive and significant effect on appearance anxiety, so hypotheses 1-4 were accepted and hypotheses 1-3 were rejected.

Said in a study on the relationship between appearance management behavior and self-esteem according to appearance satisfaction and body image perception, it was found that appearance satisfaction increases body image perception and affects self-esteem[32]. This is consistent with the researcher's study, which showed that higher self-esteem had a determining effect on body confidence.

**Table 5.** Verification of hypothesis 1.

Dependent variable	Independent variable	B	se	$\beta$	t	p
Appearance confidence	(a constant)	1.770	.354		5.005	.000***
	Positive self-esteem	.523	.066	.487	7.929	.000***
	Negative self-esteem	-.227	.062	-.224	-3.642	.000***
R <sup>2</sup> = .420, F(2,242)=87.487***						
Appearance anxiety	(a constant)	1.929	.390		4.948	.000***
	Positive self-esteem	-.107	.073	-.099	-1.472	.142

	Negative self-esteem	.503	.069	.491	7.330	.000***
$R^2 = .310, F(2,242) = 54.318^{***}$						

Note: \*  $p < .05$ , \*\*  $p < .01$ , \*\*\*  $p < .001$ .

Multiple regression analysis was conducted to investigate the effect of self-esteem on beauty interest among college students, and the results are shown in < Table 6>. The results of the analysis showed that positive self-esteem ( $B=0.186, \beta=.155, t=1.967, p>.05$ ) did not have a statistically significant effect on self-directed interest, and negative self-esteem ( $B=-0.078, \beta=-.069, t=-0.874, p>.05$ ) also did not have a statistically significant effect on self-directed interest, so both hypotheses 2-1 and 2-2 were rejected.

Positive self-esteem ( $B=0.327, \beta=.233, t=2.945, p<.01$ ) was found to have a positive and significant effect on others trend interest, and negative self-esteem ( $B=0.257, \beta=.194, t=2.449, p<.05$ ) was found to have a positive and significant effect on others trend interest, so hypotheses 2-3 and 2-4 were accepted.

**Table 6.** Verification of hypothesis 2.

Dependent variable	Independent variable	B	se	$\beta$	t	p
Self-directed interest	(a constant)	2.696	.507		5.317	.000***
	Positive self-esteem	.185	.095	.155	1.957	.051
	Negative self-esteem	-.078	.089	-.069	-0.874	.383
$R^2 = .042, F(2,242) = 5.247^{**}$						
Others trend interest	(a constant)	.427	.595		.718	.474
	Positive self-esteem	.327	.111	.233	2.945	.004**
	Negative self-esteem	.257	.105	.194	2.449	.015*
$R^2 = .037, F(2,242) = 4.689^*$						

Note: \*  $p < .05$ , \*\*  $p < .01$ , \*\*\*  $p < .001$ .

Multiple regression analysis was conducted to investigate the effect of students' appearance satisfaction on beauty interest, and the results are shown in Table 7. The results showed that self-confidence ( $B=0.531, \beta=.476, t=6.578, p<.001$ ) had a significant positive effect on self-consciousness, and body insecurity ( $B=0.362, \beta=.328, t=4.526, p<.001$ ) also had a significant positive effect on self-consciousness, so both hypothesis 3-1 and hypothesis 3-2 were accepted.

Appearance self-consciousness ( $B=0.577, \beta=.441, t=6.300, p<.001$ ) has a positive and significant effect on others' fashion interest, and appearance anxiety ( $B=0.692, \beta=.535, t=7.639, p<.001$ ) has a positive and significant effect on others' fashion interest, so both hypotheses 3-3 and 3-4 are accepted.

**Table 7.** Verification of hypothesis 3.

Dependent variable	Independent variable	B	se	$\beta$	t	p
Self-directed interest	(a constant)	.539	.425		1.269	.206
	Appearance confidence	.531	.081	.476	6.578	.000***
	Appearance anxiety	.362	.080	.328	4.526	.000***
$R^2 = .154, F(2,242) = 22.033^{***}$						
Others trend	(a constant)	-1.466	.481		-3.045	.003**

interest	Appearance confidence	.577	.092	.441	6.300	.000***
	Appearance anxiety	.692	.091	.535	7.639	.000***

$R^2 = .208, F(2,242) = 31.862^{***}$

Note: \*  $p < .05$ , \*\*  $p < .01$ , \*\*\*  $p < .001$ .

## 5. Conclusion and Recommendations

This study investigates the relationship between self-esteem, appearance satisfaction and beauty interest among college students, and considers self-esteem, appearance satisfaction and beauty interest as research factors, and finds that self-esteem, appearance satisfaction and beauty interest are all correlated.

First, the two sub-factors of appearance satisfaction, appearance confidence and appearance anxiety, are influenced by self-esteem, and positive self-esteem has a positive effect on appearance confidence, and negative self-esteem has a negative effect on appearance confidence and a positive effect on appearance anxiety. In other words, self-esteem has a significant effect on appearance confidence and appearance anxiety, and it can be seen that the higher the self-esteem, the more confident the person is in his or her appearance, and the lower the self-esteem, the less confident the person is in his or her appearance and the more insecure the person is in his or her appearance.

Second, both positive and negative self-esteem are positively and significantly influenced by the beauty interest sub-factor, other trend interests. This means that people with positive self-esteem are more sensitive to other people's trends, and people with negative self-esteem are also more likely to notice other people's trends.

Third, the two sub-factors of beauty interest, self-directed interest and other trend interest, are influenced by appearance satisfaction, which has a determining effect on the two sub-factors of appearance satisfaction, self-directed interest and other trend interest. This means that when appearance satisfaction is high, beauty interest increases to decorate oneself, and when appearance satisfaction is low, beauty interest increases to fill in the gaps.

The aforementioned findings have the following implications.

The study revealed a significant correlation between college students' self-esteem and appearance satisfaction and their interest in beauty. This suggests that the two sub-dimensions of positive self-esteem and negative self-esteem, as well as the two sub-dimensions of appearance confidence and appearance anxiety, influence beauty interest through psychological processes.

In other words, college students exhibit a high level of interest in beauty, driven by self-esteem and appearance satisfaction. They are also sensitive to the views and trends of others, which are common in both factors. This study is expected to provide basic data for the development of marketing strategies and products or services for college students in beauty-related businesses and help the beauty industry grow.

This study is limited in several ways. The study is limited to university students at four-year universities in Gyeonggi-do, and the sample size is relatively small at 250 copies. In a follow-up study, it would be beneficial to conduct a survey of universities across the country.

As the beauty industry develops, the market for beauty products is expanding, leading to an increase in various forms of consumption. Therefore, it would be beneficial to analyze beauty

interest from a holistic perspective by conducting various surveys centered on different generations. In order to gain a more comprehensive understanding of the subject, more in-depth and continuous follow-up research is needed.

This study conducted a subjectivity study on the subjects of workers in the skin care industry who performed meridian massage on the field.

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## 7. Appendix

### 7.1. Author's contribution

	Initial name	Contribution
Lead Author	MJ	-Set of concepts <input checked="" type="checkbox"/> -Design <input checked="" type="checkbox"/> -Getting results <input checked="" type="checkbox"/> -Analysis <input checked="" type="checkbox"/> -Make a significant contribution to collection <input checked="" type="checkbox"/>
Corresponding Author*	JC	-Final approval of the paper <input checked="" type="checkbox"/> -Corresponding <input checked="" type="checkbox"/> -Play a decisive role in modification <input checked="" type="checkbox"/> -Significant contributions to concepts, designs, practices, analysis and interpretation of data <input checked="" type="checkbox"/>
Co-Author	JS	-Participants in Drafting and Revising Papers <input checked="" type="checkbox"/> -Someone who can explain all aspects of the paper <input checked="" type="checkbox"/>

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E-mail: poshop99@naver.com

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## The Effect of Beauty Shop Service Quality on Revisit Intention

Jeongmi Kim<sup>1</sup>

*Korea Open Cyber University, Seoul, Republic of Korea*

Eunjoo Choi<sup>2\*</sup>

*Westminster Graduate University, Yongin, Republic of Korea*

### Abstract

**Purpose:** The competitive environment of the beauty service industry entered into fierce competition due to factors such as the opening of the service industry and the diversification, advancement, and multi-attributes of the economy. Consumers choose a store with a wide variety of needs and thoughts, and their intention to reuse is determined by the behavior of internal customers they meet at one-on-one contact points with customers. The purpose of this study is to suggest a way to become a competitive beauty shop by providing better service to customers by confirming the relationship between service quality, customer satisfaction, and revisit intention through empirical analysis.

**Method:** In this study, prior research and empirical research were conducted in parallel for the purpose of the study, and a research model was established based on the existing prior research. In order to verify the validity of the research model, 500 copies were finally used for empirical analysis using an online survey method centered on female users who visited domestic beauty shops (hair, skin, nail, makeup). Statistical analysis was performed using programs (SPSS 23.0, AMOS 23.0) as an analysis method, and statistical methods such as frequency analysis, cross-tabulation, factor analysis, variance analysis, and structural equations were analyzed and processed.

**Results:** First, as a result of analyzing the difference in service quality according to age, it was found that response, empathy, materiality, and reliability factors were statistically different. Response, empathy, and reliability were high in the 40s, and materiality was high in the 20s. Second, as a result of analyzing the difference in service quality according to the most used beauty shop, it was found that there was a difference in the empathy factor. As a result of the post-hoc test, there were differences in makeup, skin care, and nail beauty, and the empathy of skin care and nail beauty was analyzed to be higher than makeup. Third, as a result of analyzing the differences in the Revisit Intention factor according to the Most used beauty shop, the Revisit Intention factor was statistically significant, and it was analyzed that the Revisit Intention of nail beauty was higher than that of makeup. Fourth, as a result of examining the extent to which service quality factors using AMOS affect overall Revisit Intention, among service quality factors, reliability has the greatest impact, and response, empathy, materiality, and professionalism do not directly affect Revisit Intention.

**Conclusion:** Customers who visit beauty service companies today have a variety of needs, and it has become competitive to derive customer satisfaction with more delicate consideration. It can be seen that the improvement of overall service quality has a direct effect on Revisit Intention, and it was found that customers revisit due to reliability. Due to the nature of the beauty industry, which relies heavily on human resources, research on how it will affect customers' Revisit Intention is expected to provide many implications for strengthening the competitiveness of the beauty industry in the future.

**Keywords:** Beauty Shop, Service Quality, Revisit Intention, Reliability, Strengthening Competitiveness

## 1. Introduction

In modern society, with the improvement of people's standard of living, the share of the service industry in the industrial structure is gradually increasing. In particular, the beauty service industry is growing in various fields, and as consumer needs diversify and become individualized[1], it is growing into a major area of the total fashion industry as it is specialized and subdivided into hair, makeup, skin care, and nail care fields. There is[2]. Recently, as Korean women have more opportunities to advance into society, their appearance is important, and interest and demand for the act of decorating themselves is gradually increasing[3]. In order to satisfy the various needs of these consumers, beauty services are gradually becoming more specialized and subdivided, and there is a tendency to prioritize the quality of services[4]. It has changed to a place to do[5].

Due to factors such as the opening of the beauty service industry and the diversification, advancement, and multi-attributes of the economy, a very fierce competition has entered[6]. Individual small business beauty companies are complaining of difficulties in managing their strengths because they do not know what the most necessary key elements are [7][8], and they do not know what they need the most in their relationship with customers. In an internal and external environment where the market is gradually segmented, consumers choose a store with a wide variety of needs and thoughts[9], and their intention to reuse is determined by the behavior of internal customers they meet at one-on-one contact points with customers[10]. However, a large number of individual beauty companies, which are growing rapidly, rely on technical training without practical training on management or marketing.

This study aims to provide more basic and clear management decision-making information by identifying the impact of service quality of beauty shops on customer satisfaction and revisit intention[11], and identifying the factors that make customers revisit[12]. Also, according to the type of beauty shop, we want to check what is the most important factor among beauty shop servicing quality. In addition, we want to present a way to become a competitive beauty shop by providing better service to customers by breaking away from the management method of simply providing beauty services in terms of relationships with customers[13].

## 2. Theoretical Background

### 2.1. Research topic

In this study, as a study on the effect of beauty shop service quality on Revisit Intention, the subject of the survey was conducted on customers who visited a beauty shop. The number of personnel was determined for each field. As for the spatial scope of this study, 500 copies were finally used for empirical analysis using the online survey method nationwide. Accurate data could be collected because the panelists participated through the research institute, and the number of customers who experienced hair, skin, nail, and makeup was set at 125, and an accurate survey was conducted.

### 2.2. Survey design and variable definition

The contents of the questionnaire were modified and supplemented according to the purpose of the study by referring to the results of previous studies. The questions consisted of a total of 52 questions and were measured using a 5-point Likert scale (44 questions) and a nominal scale (8 questions).

#### 2.2.1. Service quality

Service quality refers to the degree to which a service company gives trust to customers and

accurately provides services[14], guarantees that indicate the degree to which trust and confidence can be given, physical equipment visible to the service company, and appearance of employees. It is divided into five dimensions: materiality, which represents the customer's interest, empathy, which represents the interest, attention, or consideration given to customers individually[15], and responsiveness, which represents the degree to which a service provider can voluntarily help customers and provide prompt service.

In this study, the 5-dimensional service quality measurement scale of SERVQUAL and the items of KS-SQI, in which detailed measurement items were readjusted to suit the characteristics of the domestic service industry, were used with a modified and supplemented scale suitable for beauty shops[16][17]. Professionalism 6 items, response 6 items, empathy 5 items, materiality 5 items, reliability 4 items, total 5 items, 28 items. The perception of service quality is a 5-point Likert scale, and the higher the score, the higher the recognition level.

### **2.2.2. Professionalism**

Customers perceive that service providers, employees, operating systems, and physical resources have the necessary knowledge or skills to solve their problems using specialized methods[18].

### **2.2.3. Response**

It refers to the ability to provide prompt service when needed by customers, information on service provision, attitude of employees to provide prompt service, and attitude to respond to customer requests even in busy situations.

### **2.2.4. Empathy**

As individual attention and consideration provided by the company to the customer, narrowing the distance with the customer, including elements of communication and understanding with the customer, the company's interest in the individual customer, adjustment of the time zone desired by the customer, personal consideration and interest in the customer, It refers to the understanding of employees who want to give the maximum benefit to the customer or the customer's desire.

### **2.2.5. Materiality**

It refers to physical facilities, equipment and service personnel, and the appearance of service materials, including the latest modern facilities and facility exteriors, the neat appearance of employees, and overall service-related data (manuals, pamphlets)[19].

### **2.2.6. Reliability**

Consistent and accurate service performance refers to keeping accurate calculations and records, and performing services on time[20].

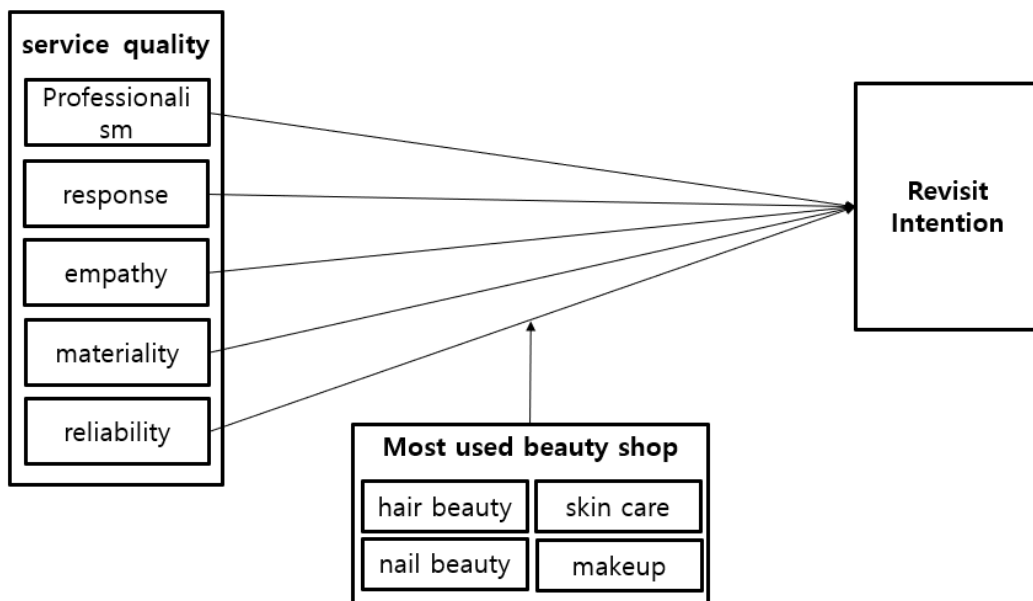
### **2.2.7. Revisit intention**

Customer satisfaction is the result of meeting the customer's needs and expectations, resulting in repurchase of the product[21], and the state in which the customer's trust in the business continues, which is called CS (Customer Satisfaction)[22]. Revisit Intention consists of a total of 17 items in 4 types with the customer's intention to make various purchases and revisits, such as being satisfied with the services and products of employees after experiencing the service and word of mouth. Revisit intention is a 5-point Likert scale, with higher scores indicating higher revisit intention.

### 2.3. Research model

In this study, a total of 44 variables were used in the analysis as measurement questions based on previous studies and literature studies for an empirical analysis of the factors of beauty shop service quality, communication response, and Revisit Intention, and service quality as factors for each item. was set as a total of five factors: professionalism, response, empathy, materiality, and reliability. The intention to revisit was composed of a single factor, and this empirical analysis was conducted with a total of six factors, and the composition of questions for each factor was modified and improved to fit this study based on the following literature. The research model is shown in <Figure 1>.

Figure 1. Research model.



### 2.4. Data analysis

The data of this study were computerized using SPSS 23.0 and AMOS 23.0. The level of significance was set at  $p < .05$  or  $p < .01$ ,  $p < .001$ , and statistical methods such as frequency analysis, cross-tabulation, factor analysis, ANOVA, and structural equation were analyzed and processed.

Structural equation modeling was conducted to verify the validity of the measurement tool used in this study. The structural equation model is composed of a measurement model and a structural model. The measurement model reflects the characteristics of confirmatory factor analysis, and the structural model reflects the characteristics of multiple regression analysis or path analysis. Since SEM first establishes a model and then seeks to know how well the model fits the data, it can be said to have the character of a confirmatory approach rather than an exploratory approach.

## 3. Research Results

### 3.1. Demographic characteristics

The exploratory factor analysis was performed to verify the validity of the variables used in As for demographic characteristics, 500 women (100.0%) were surveyed by gender, and by age, 147 people (29.4%) in their 20s or younger, 225 people in their 30s (45.0%), and 128 people in

their 40s or older (25.6%). has been investigated As for the final education level, 60 people (12.0%) graduated from high school or less, 75 people (15.0%) graduated from junior college, 323 people (64.6%) attended or graduated from university, and 42 people (8.4%) attended or graduated from graduate school.

### 3.2. Validity and reliability analysis

Exploratory factor analysis was conducted to verify the validity of the measurement tools used in this study. Factor loading is 0.5 or more, C.R.=1.965 or more,  $p < 0.000$ , and AVE (average variance extraction) value must be 0.5 or more to have convergent validity. Since all of the above conditions are satisfied for each factor, it can be regarded as having convergent validity. In addition, as a result of calculating the conceptual reliability value of each latent variable, the conceptual reliability value of all factors was higher than 0.7, so it has convergent validity.

### 3.3. Difference analysis of service quality according to age

As a result of analyzing the differences in the five factors according to age, it was found that there were statistical differences in the factors of response, empathy, materiality, and reliability under the significance levels of  $p < 0.05$ , 0.01, and 0.001. Response, empathy, and reliability were high in the 40s, and materiality was high in the 20s, as shown in <Table 1> below.

**Table 1.** Difference analysis of service quality according to age.

Service quality	Age	Mean	Standard Deviation	Number of Samples	F Value	Significance Probability
Professionalism	under 20	3.393	0.752	147	0.949	.388
	30's	3.459	0.707	225		
	40+	3.514	0.745	128		
Response	under 20	3.289	0.787	147	5.545	.004**
	30's	3.513	0.741	225		
	40+	3.570	0.781	128		
Empathy	under 20	2.872	0.799	147	6.662	.001***
	30's	3.109	0.754	225		
	40+	3.203	0.847	128		
Materiality	under 20	3.605	0.734	147	4.148	.016*
	30's	3.422	0.648	225		
	40+	3.582	0.626	128		
Reliability	under 20	3.179	0.603	147	8.737	.000***
	30's	3.210	0.674	225		
	40+	3.474	0.650	128		

Note:  $p < 0.05$ \*,  $p < 0.01$ \*\* ,  $p < 0.001$ \*\*\*.

### 3.4. Service quality difference analysis according to most used beauty shop

As a result of analyzing the differences in the five factors of service quality according to the most used beauty shop, there was a statistical difference in the empathy factor under the significance level  $p < 0.001$ . The averages of the empathy factors were hair beauty 3.075, nail beauty 3.190, skin care 3.174, and makeup 2.819, respectively. For the post-hoc test of the empathy factor, a post-hoc test was performed through the Scheffe test. As a result of the post-hoc test,

there were differences in makeup, skin care, and nail beauty, and the empathy of skin care and nail beauty was analyzed to be higher than makeup, as shown in <Table 2> below.

**Table 2.** Service quality difference analysis according to most used beauty shop.

Service quality	Most used beauty shop	Mean	Standard Deviation	Number of Samples	F Value	Significance Probability
Empathy	Hair beauty	3.075	0.836	126	5.919	.001***
	Nail beauty	3.190	0.783	123		
	Skin care	3.174	0.792	125		
	Makeup	2.819	0.742	126		

Note:  $p < 0.001$ \*\*\*.

### 3.5. Differences in intention to reuse according to the most used beauty shop

As a result of analyzing the differences in Revisit Intention factors according to the most used beauty shop, there was a difference under the significance level  $p < 0.01$ . The average of the Revisit Intention factors was hair beauty 3.439, nail beauty 3.447, skin care 3.339, and makeup 3.156, respectively. As a result of the post-test, there was a difference between nail beauty and makeup, and the revisit intention for nail beauty was higher than makeup. was analyzed, and is shown in <Table 3> below.

**Table 3.** Differences in reuse intention according to most used beauty shop.

Variable	Age	Mean	Standard Deviation	Number of Samples	F Value	Significance Probability
Most used beauty shop	Hair beauty	3.439	0.777	126	4.454	.004**
	Nail beauty	3.477	0.713	123		
	Skin care	3.339	0.831	125		
	Makeup	3.156	0.716	126		

Note:  $p < 0.01$ \*\*.

### 3.6. Determinants of revisit intention by most used beauty shop

Multi-group analysis was conducted to estimate the Cross-Group Equality Constraint Model for each most used beauty shop. For each Revisit Intention determinant comparison, if the fitness of the model with constraints through comparison is relatively worse than the fitness of the model without constraints, the path coefficient can be said to be different across groups.

#### 3.6.1. Planning factors for intention to revisit hair beauty

Weighted to scale based on aggregate cost for hair beauty aggregate. When the amount of change increases to 2111.369 and becomes 3.84, it indicates that it is statistically indicated at  $p < 0.05$ . In this model, it is logical that the hair beauty group is statistically significant. In order to check the number of linear systems, let them appear individually in a set, and vertical changes may occur, as shown in <Table 4> below.

**Table 4.** Multi-group analysis results (hair beauty).

Direct effect	Path coefficient		Final model $\chi^2$	Hair beauty $\chi^2$ change
	Final model	Hair beauty		
Response → Revisit Intention	.145	-.265	2610.961	499.592
Empathy → Revisit Intention	.011	-.723		
Materiality → Revisit Intention	-.078	-.804		
Reliability → Revisit Intention	.671***	2.144		
Professionalism → Revisit Intention	-.103	-.181		

Note:  $p < 0.05$ \*,  $p < 0.001$ \*\*\*.

### 3.6.2. Determinants of nail beauty revisit intention

The amount of change was calculated to verify whether there was a difference between groups for nail beauty group variables. The change amount is 2085.444, and if the change amount is 3.84 or more, it is considered statistically significant at  $p < 0.05$ . In this model, the nail beauty group variable was found to be statistically significant. In order to verify the difference in path coefficient, it was estimated individually in the group, and no statistical change appeared, as shown in <Table 5> below.

**Table 5.** Multi-group analysis results (nail beauty).

Direct effect	Path coefficient		Final model $\chi^2$	Hair beauty $\chi^2$ change
	Final model	Nail beauty		
Response → Revisit Intention	.145	.352	2610.961	525.517
Empathy → Revisit Intention	.011	.192		
Materiality → Revisit Intention	-.078	.345		
Reliability → Revisit Intention	.671***	.174		
Professionalism → Revisit Intention	-.103	-.221		

Note:  $p < 0.05$ ,  $p < 0.001$ \*\*\*.

### 3.6.3. Determinants of skin care revisit intention

The amount of change was calculated to verify whether there was a difference between groups for skin care group variables. The change amount is 2157.993, and if the change amount is 3.84 or more, it is considered statistically significant at  $p < 0.05$ . In this model, the skin care group variable was found to be statistically significant. In order to verify the difference in path coefficients, it was estimated individually in the group, and it was found that there was a statistical change in the path coefficients in which reliability affected Revisit Intention, as shown in <Table 6> below.

**Table 6.** Multigroup analysis results (skin care).

Direct effect	Path coefficient		Final model $\chi^2$	Hair beauty $\chi^2$ change
	Final model	Skin care		
Response → Revisit Intention	.145	.611	2610.961	452.968

Empathy → Revisit Intention	.011	-.380		
Materiality → Revisit Intention	-.078	-.263		
Reliability → Revisit Intention	.671***	1.718*		
Professionalism → Revisit Intention	-.103	-.484		

Note: p<0.05 \*, p<0.001\*\*\*.

### 3.6.4. Determinants of makeup revisit intention

The amount of change was calculated to verify whether there was a difference between groups for makeup group variables. The change amount is 2139.262, and if the change amount is 3.84 or more, it is considered statistically significant at p<0.05. In this model, the makeup group variable was found to be statistically significant. In order to verify the difference in path coefficients, they were estimated individually in the group, and it was found that there was a statistical change in the path coefficients in which reliability affected Revisit Intention, as shown in <Table 7> below.

**Table 7.** Multigroup analysis results (makeup).

Direct effect	Path coefficient		Final model χ <sup>2</sup>	Hair beauty χ <sup>2</sup> change
	Final model	Makeup		
Response → Revisit Intention	.145	.244	2610.961	471.699
Empathy → Revisit Intention	.011	-.218		
Materiality → Revisit Intention	-.078	-.053		
Reliability → Revisit Intention	.671***	1.016**		
Professionalism → Revisit Intention	-.103	.158		

Note: P<0.05 \*, P<0.001\*\*\*.

## 4. Summary and Discussion

First, as a result of analyzing the difference in five factors according to age, there were differences in response, empathy, materiality, and reliability factors. Response, empathy, and reliability were high in the 40s, and materiality was high in the 20s. Second, as for the service quality factor by most used beauty shop, there was a statistical difference in empathy. In the empathy factor, it was found that the empathy of nail beauty was higher than that of hair beauty, skin care, and makeup compared to other beauty shops. As a result of the post-hoc test of the empathy factor, there was a difference in makeup, skin care, and nail beauty, and the empathy of skin care and nail beauty was analyzed to be higher than makeup. Third. In the difference in reuse according to the most used beauty shop, it was found that nail beauty had a higher Revisit Intention than other beauty shops. The reason why nail beauty has a high Revisit Intention seems to be because the maintenance power of nail beauty is shorter than other procedures and nails require periodic maintenance [23]. Fourth, As a result of dividing the main service quality into sub-factors of response, empathy, materiality, reliability, and professionalism, and analyzing the relationship between Revisit Intention and influence, it was found that only reliability has a direct effect on Revisit Intention for all respondents. obtained different results. Kim Min-jung (2007) found that the effect of beauty service quality on customer satisfaction and the effect of customer satisfaction on customer loyalty are factors in which reliability and response affect customer satisfaction, with response having a greater impact than reliability [24][25], and

Petrona (2010) found that response was the most important factor in the effect of service quality on customer satisfaction and revisit intention in beauty salons, and that service quality had a significant impact on customer satisfaction. said to be crazy [26].

As a result of verifying whether there was a difference between groups for each group variable for each beauty field, it was found that the group variable for each beauty field was statistically significant. As a result of verifying the difference in path coefficients, it was found that the reliability of the skin care and makeup groups was more affected. As for reliability, both the manager and employees of the shop must make efforts to secure reliability. It is necessary to keep secrets about private life, to be able to trust the service just by hearing the name of the shop [27], and to develop a program to manage customers [28].

In this study, a study was conducted on women who frequently visit beauty shops [29]. However, the aesthetic level of men has also increased in modern society [30], and it seems that the elderly need to visit beauty shops in the modern society entering the aging era [31]. Therefore, in future research, it is suggested to find out more subdivided beauty shop Revisit Intention by gender and age.

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## 6. Appendix

### 6.1. Author's contribution

	Initial name	Contribution
Lead Author	JK	<ul style="list-style-type: none"><li>-Set of concepts <input checked="" type="checkbox"/></li><li>-Design <input checked="" type="checkbox"/></li><li>-Getting results <input checked="" type="checkbox"/></li><li>-Analysis <input checked="" type="checkbox"/></li><li>-Make a significant contribution to collection <input checked="" type="checkbox"/></li><li>-Final approval of the paper <input checked="" type="checkbox"/></li><li>-Corresponding <input checked="" type="checkbox"/></li><li>-Play a decisive role in modification <input checked="" type="checkbox"/></li></ul>
Corresponding Author*	EC	<ul style="list-style-type: none"><li>-Significant contributions to concepts, designs, practices, analysis and interpretation of data <input checked="" type="checkbox"/></li><li>-Participants in Drafting and Revising Papers <input checked="" type="checkbox"/></li><li>-Someone who can explain all aspects of the paper <input checked="" type="checkbox"/></li></ul>

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# Protection Convergence

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Corresponding author\*  
E-mail: jaebumlee@mju.ac.kr

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## Emergence and Transformation of K-Smart Beauty Care

Sejin Kim<sup>1</sup>

*Sejin Skin & Body, Jeju, Republic of Korea*

Jaebum Lee<sup>2\*</sup>

*Myongji University, Seoul, Republic of Korea*

### Abstract

**Purpose:** K-smart beauty is securing an important position in the global beauty industry through innovation based on a scientific approach and the latest technology. This satisfies consumers' diverse appearance management needs and conveys the positive values of the new K-culture. In this study, we aim to examine changes in Korean beauty care behavior for the pursuit of health interventions and aesthetics that meet consumer requirements and preferences.

**Method:** This study investigated academic research published by the Korea Research Information Sharing Service ([www.riss.kr](http://www.riss.kr)), data from Korea's government-funded research institutes, and media articles to investigate the recent change process of K-beauty. Purpose of the study a literature review was conducted by organizing the contents that corresponded to the above.

**Results:** The beauty industry in Korean society is going through a process of specialization, segmentation, and cutting-edge technology, and is transforming into smart beauty through continuous innovation. Changing consumer awareness of beauty care was at work on this basis, and various factors such as technological development and distribution of beauty equipment, diversification of service provision to consumers, and globalization of K-culture were confirmed to have a complex synergistic effect.

**Conclusion:** In Korean society, the perception of beauty care is changing beyond simple appearance care to the concept of smart beauty, which includes health interventions. It has been confirmed that these changes enable the provision of efficient and economical services and are gradually moving towards data-based customized services for everyone while protecting the environment.

**Keywords:** K-Smart Beauty, Emergence, Transformation, K-Culture, Perception

## 1. Introduction

Recently, Korea's beauty industry has been transformed into a high-value, new growth industry incorporating innovative technologies, bringing about significant changes to the service industry as well as the economy and society. Accordingly, interest in 'healing' and 'well-being' is leading to the beauty industry and acting as a factor that places more importance on individual leisure time. And changes in awareness of work & life balance are causing a surge in demand for beauty services and products [1][2].

The basic concept of wellness, which is commonly recognized around the world, is a concept that encompasses overall physical, mental, social, cognitive, and spiritual health. However, the methods of implementing and practicing wellness vary in each country and culture, and these differences are determined by cultural background, traditional health views, and eating habits [3]. The Korean wellness concept has also begun to merge with the beauty industry to meet social changes and demands, and is transforming beyond the existing scope of beauty such as

cosmetics and skin care into Korean-style wellness including systematic beauty care, physical strength care, and stress care[4].

Many of Korea's recent skin care products are being released that go beyond simply pursuing external beauty and aim to improve skin health and prevent skin aging. In addition, 'early anti-aging', in which the younger generation pursuing a healthy lifestyle approaches skin aging early to prepare for skin aging, is booming. As the average lifespan increases due to the aging phenomenon, this can be seen as a departure from the traditional view of old age as simply a period of aging and deterioration, and recognition of old age as a new stage of life. Therefore, the concept of 'active aging', which reflects a lively and active life, is gaining prominence throughout society[5][6].

Currently, Korea's beauty industry is being strengthened in the form of smart beauty services, which are a fusion of intelligent information technology and beauty based on digital information, and the ICT beauty industry has already become a part of life. Internet of Things technology is connected to beauty equipment and analyzes the user's skin condition and product usage habits to recommend services tailored to each individual's skin characteristics and provide methods for personalized beauty care. Modern Korean digital cutting-edge technology can analyze facial images and measure body shape, and provides optimal beauty management feedback by considering individual body factors. Therefore, clear and specific beauty services lead to securing a variety of customers and serve as the basis for innovation[7][8].

Smart beauty can be said to be a system that combines the innovative functions of beauty equipment and digital technology to provide a scientifically tailored approach to improve an individual's appearance in a healthy and beautiful way. Existing beauty care methods used cosmetics as a medium for manual care focusing on the strength and weakness of hand touch and circulation, so there were limits to the scientific basis for anti-aging effectiveness or sustainability. However, with the development of skin science, beauty care no longer relies solely on emotion and senses, but is now based on scientific measurement and evaluation, and scientific understanding for maintenance and management by accurately finding the cause of aging is reflected in services.

This Korean-style smart beauty is expected to secure an important position along with K-culture in the global beauty industry through the latest technological innovation. Accordingly, this study seeks to confirm the process of beauty care change in Korean society and the effectiveness of smart beauty care according to digital technology innovation, and to make suggestions for the sustainability of K-smart beauty care.

## **2. Process of Change in Beauty Care Concept in Korean Society**

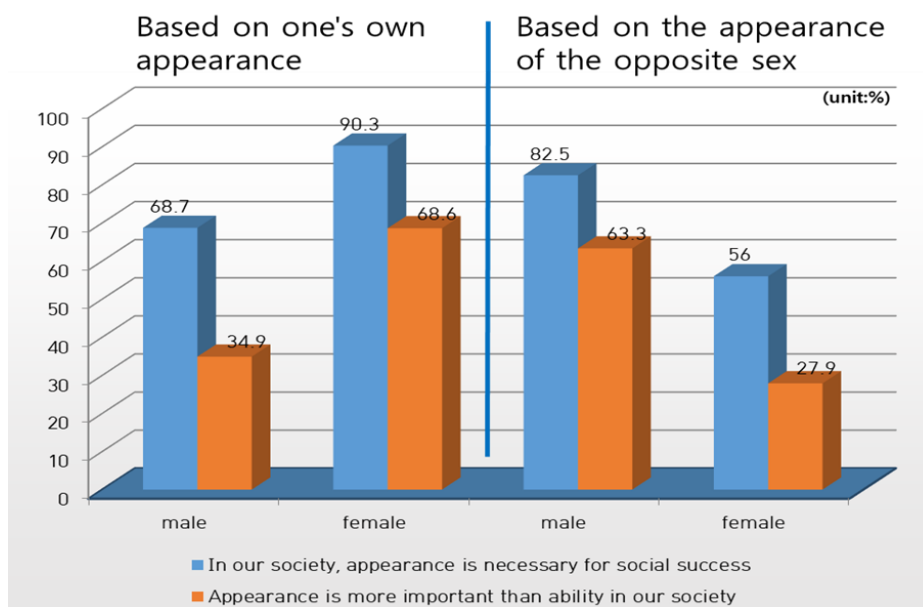
The Korean beauty industry has continuously changed from the past to the present. These changes are characterized by further expansion and leading to new trends as the desire for 'beauty' goes beyond simple decoration of beauty and develops into content that goes along with culture. This phenomenon has moved away from the days when only beautiful models appeared in advertisements, and we can see people of various body types and ages being used as models. This can be said to reflect the values of modern Korean society, which recognizes the diversity of beauty and respects tastes.

It can be said that the perception of human appearance has undergone many changes from the past to the present. When there is a change in culture or environment, or when inner values change, the act of taking care of one's appearance also naturally changes. As the importance of appearance is highlighted in Korea, interest in beauty is increasing regardless of gender or age,

which is a social trend. Modern people value exercise and regular lifestyle habits to regain physical vitality and maintain health, and mentally pursue self-development and internal growth. Appearance management behavior plays an important role as a part of self-expression and self-development, and serves as a key element in expressing and developing oneself and forming identity[9][10].

In Korea, in the past, the concept of being naturally ‘beautiful’ or ‘handsome’ was mainly emphasized, and appearance was mostly thought to be determined by genetic factors. However, in modern society, the social concept that appearance is something that is managed and created is mainly emphasized. This strengthening of awareness is leading to interest in and investment in appearance management, and is believed to have a significant impact on social interactions[8]. Korea's younger generation is attaching value to personal style and fashion in order to build a foundation to stand out in society. Each person invests in various ways such as skin care, exercise, and health care to make their appearance stand out according to fashion and trends[11]. <Figure 1> below charts the importance of appearance as perceived by Koreans.

**Figure 1.** Percentage of awareness of the importance of appearance among men and women in Korean society[11].



Looking at the composition by age class of the National Statistical Office of the Republic of Korea, statistics show that in the 1960s, the number of elderly people per 100 youth population was only 6.9, but as of 2024, the number of elderly people per 100 youth population has reached 181.2. If this trend continues, it is expected that the elderly population will be more than seven times the youth population by 2072. There are voices of concern across society about Korea's aging population, including economic burden, imbalance in population structure, and labor shortage. However, there is also a view that it may provide an opportunity for a reversal in line with the aging trend. Various industries such as beauty and health, leisure and recreation, and education for the elderly are expected to grow, and awareness of the possibility of living a healthy and active old age is also expanding[12].

In Korea, there is another generation that expresses themselves and lives a vibrant life just as much as the younger generation. There is a generation of active seniors in their 50s and beyond who have experienced various changes in their lives during the process from the past to the present. They are at a stage where they can enjoy a rich life based on various experiences and wisdom in life, and they are also an age group that knows how to increase satisfaction in

order to be recognized for their areas of value. For the active senior generation, aging is an inevitable process, but they hope to grow older while maintaining a healthy and energetic youth[13].

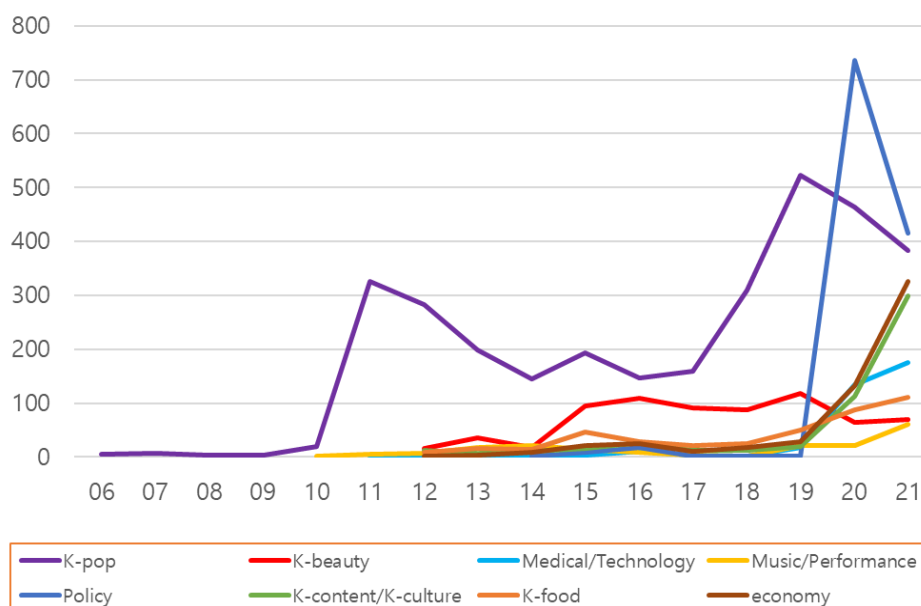
In Korean society, the concept of beauty is further amplified due to social changes and the development of digital technology. Smart beauty companies are developing and recommending new convergence content such as virtual makeup services and customized skin care product recommendations by combining new technologies such as AI (artificial intelligence), big data, VR (virtual reality), and AR (augmented reality). The convergence of consumer demands and technology is expanding the boundaries of the beauty industry and providing new user experiences[7]. Korea's modern beauty industry goes beyond appearance management and focuses on integrated beauty management aimed at improving individual health, well-being, and quality of life.

### 3. Mutual Growth and Academic Identity of K-culture and K-beauty

In Korean society, K-smart beauty is the result of applying big data and AI technology, and is changing in the direction of measuring body condition using the digital functions of beauty equipment and providing customized beauty care and solutions. This academically is also changing to the concept of interdisciplinary studies that looks at health intervention factors and aesthetic pursuits as a whole.

Currently, Korea uses the word 'beauty' in combination with the word 'health' or understands it by including beauty within the category of health. This can be seen as a process in which the so-called words beauty & health are becoming generalized. In the past, the term beauty was mainly understood as emphasizing external beauty, but recently its scope has expanded and is being replaced by a term that encompasses the concept of health, including internal and external areas. Accordingly, it can be seen that appearance care behavior is also changing into beauty care behavior[14].

Figure 2. Percentage analysis of K's growth trend[15].



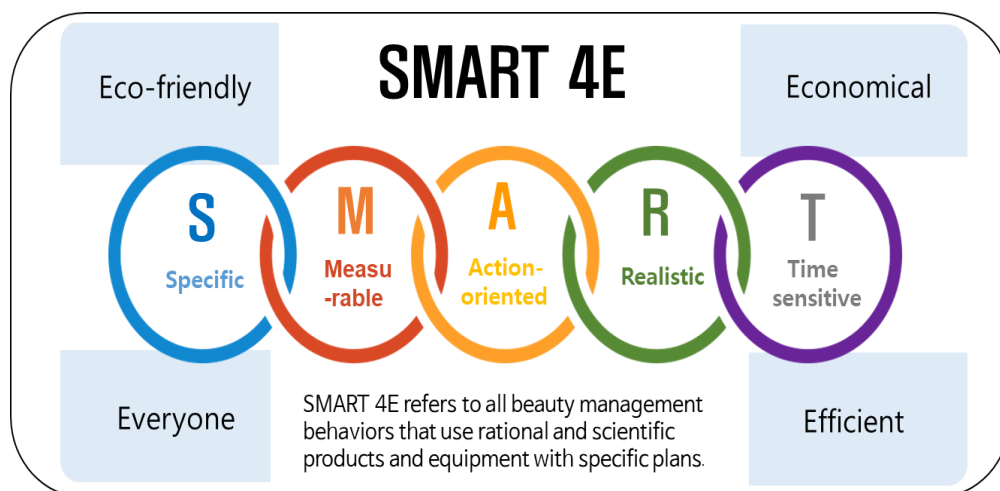
Currently, the successful strategy of Korea's beauty-related convergence system and paradigm is supported by the complex background of K-culture, which is receiving global attention. The successful overseas expansion of K-pop and K-drama, which can be said to be the spread of the Korean Wave, led to the emergence of a new word, 'Korean Dream', which is interpreted to mean that cultural content plays a role in conveying dreams and hopes to people [16].

The global popularity of K-culture encompasses the cultures of various countries, is based on the most Korean uniqueness and originality, contains the phenomenon of the times, and forms the basis for promoting interests. It can be said that the overseas activities of Korean Wave artists and the passionate support of fans have changed preferences and standards related to the K-beauty industry and led to the emergence of new business models and marketing strategies. Due to the global attention on various K-cultures, it can be said that K-beauty such as Korean makeup, skin care, hair styling, cosmetics, and fashion became an opportunity to become the center of global beauty [17].

Considering these changes in K-beauty, the concept of K-smart beauty can be expanded and interpreted. SMART has the dictionary meaning of 'clever, perceptive,' etc., but it also means a symbol for each habit to set a specific goal. That is, it is expressed as S (Specific), M (Measurable), A (Action-oriented), R (Realistic), T (Time-sensitive), etc. [18]. The scope of expansion of the Korean beauty industry is gradually widening, going beyond simple aesthetic satisfaction and transforming into a convergence industry according to consumption trends in conjunction with the well-being industry such as emotional consumption. Therefore, smart beauty is pursuing the characteristics of interdisciplinary studies that includes 4E elements such as Eco-friendly, Economical, Efficient, and for Everyone, following a shift in perception to view health intervention factors and aesthetic pursuits as an integrated whole.

Additionally, in the smart beauty area, body condition is measured using AI technology and smart functions of skin care equipment. In order to improve an individual's appearance in a healthy and beautiful way, a scientifically tailored beauty care method is used that takes into account individual factors of each body factor and type. Therefore, unlike existing manual beauty methods, it can provide sophisticated and effective results and is changing into a beauty system that can scientifically reflect the process and results on how to maintain and improve skin health.

**Figure 3.** Definition of the concept of smart beauty 4E.



#### 4. Sustainability and Challenges of K-smart Beauty Care

Originally, the meaning of 'K' in 'K-beauty' was used as the initials of 'Korean Beauty', but in the past, in foreign countries, it was considered to have a negative meaning due to the influence of the word 'Kill'. "Killer" in 'Killer Contents' also has the same meaning as 'killing', 'awesome', and 'powerful' in English, and 'Contents' is also used to mean producing and distributing digital information. Therefore, it also represents a groundbreaking item to make a compelling impression on users and get a lively response. The general meaning of the word Killer can be perceived as a negative image because it also has hostile or powerful and destructive connotations [19].

However, as the Korean Wave spread globally, a wind of change blew in the perception of Korean culture and content, and Korean dramas, music, fashion, and beauty content received global attention, giving K a global and positive image. emerged. The meaning of K, which reflects Korean culture, creativity, and innovative ideas, has come to be accepted as a positive symbol of what is most Korean. This change can be said to be a good example of the power of culture, and it is true that the K-beauty industry is also receiving the halo of K-culture.

Previous research predicting the issues of consumption trends in Korea in 2024 argues for Second Society, Homo Prompt, and Ditto Consumption [20]. Second Society refers to modern society where every minute is precious and everything moves quickly. This means that due to the flood of information and rapid social changes, people have more things to see, do, and enjoy, so they move and adapt at a faster pace. Homo Prompt refers to the combination of human life and technology. Advances in artificial intelligence and technology have enabled humans to work faster and more efficiently, and the role of humans is focused on giving instructions and utilizing technology. Ditto Consumption is a concept that focuses on the development of digital content and changes in consumption patterns. Considering these rapid changes in Korean society, the smart-beauty paradigm is also viewed as a time when it is necessary to establish a strategy according to the timely needs of customers.

Innovation in digital technology is emerging as an important factor in scientific verification along with the spread of smart beauty equipment in the beauty market. Beauty road shops in Korea are introducing and operating a smart beauty system to improve customer satisfaction and convenience. The content of the change is to establish an integrated management system for beauty equipment and beauty services to maximize the effectiveness and maximization of services. The number of 'one-person beauty shops' that focus on streamlining existing management processes and improving inventory and human resource management is increasing [21][22].

This phenomenon is not only due to changes in beauty trends and securing market competitiveness, but also because it is necessary to differentiate services that incorporate cutting-edge digital technology and gain a competitive edge. In Korea, despite the strengthening of measures such as social distancing and restrictions on the number of visiting customers during the COVID-19 pandemic, demand among beauty consumers for beauty shops that provide one-to-one customized services has surged. Korean beauty consumers seek both convenience and effectiveness and want quality service for the money spent. Because one-person beauty shops operate with a reduced workforce, they use it as a core strategy for customer satisfaction, and the Customer Experience Management (CEM) system is used to provide services by analyzing service experiences [23]. Here, SNS was used as an excellent tool to learn about consumers, and it can be said that it has since become more active for the distribution of beauty equipment and feedback on customer satisfaction.

In Korea, due to the expansion of beauty equipment usage guidelines, beauty shops and equipment companies are focusing on developing new products and menus. Since the use of beauty equipment is directly related to the health and safety of consumers, it is natural that

related laws and regulations are necessary, and it is necessary to actively improve safety and improve the law. Technology is evolving rapidly and consumer demands are overwhelming. This change is expected to be a positive change in which companies will launch a variety of smart beauty equipment or home care devices, and consumers will have the opportunity to choose a variety of products[24][25][26].

## 5. Conclusion and Recommendations

In Korea, in the past, attention was mainly focused on beauty-related products and services simply to slow down facial aging. However, it can be seen that modern people go beyond simply focusing on external beauty and are more interested in a dignified and healthy retirement for personal growth and maximization of life. As the concept of wellness is emphasized, the pursuit of beauty is not simply limited to appearance, but also includes physical, mental, social health, and educational and occupational health. Modern people are showing a shift toward pursuing Korean-style wellness due to their need for personal beauty and health.

The beauty industry in Korean society is going through a process of specialization, segmentation, and cutting-edge technology, and is transforming into smart beauty through continuous innovation. In particular, due to legal regulations on the use of equipment, equipment previously used only in medical facilities has expanded into the beauty area, broadening the range of choices for consumers, and developing content based on equipment use is also actively taking place. Changing consumer awareness of beauty care was at work on this basis, and various factors such as technological development and distribution of beauty equipment, diversification of service provision to consumers, and globalization of K-culture were confirmed to have a complex synergistic effect.

Currently, in Korean society, the perception of beauty care is changing beyond simple appearance management to the concept of smart beauty, which includes health interventions. This change is evolving toward data-based customized services for everyone while enabling efficient and economical service provision and gradually protecting the environment. K-smart Beauty Care will have to pursue sustainable innovation in a changing new wave.

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## 7. Appendix

### 7.1. Author's contribution

	Initial name	Contribution
Lead Author	SK	<ul style="list-style-type: none"><li>-Set of concepts <input checked="" type="checkbox"/></li><li>-Design <input checked="" type="checkbox"/></li><li>-Getting results <input checked="" type="checkbox"/></li><li>-Analysis <input checked="" type="checkbox"/></li><li>-Make a significant contribution to collection <input checked="" type="checkbox"/></li><li>-Final approval of the paper <input checked="" type="checkbox"/></li><li>-Corresponding <input checked="" type="checkbox"/></li><li>-Play a decisive role in modification <input checked="" type="checkbox"/></li></ul>
Corresponding Author*	JL	<ul style="list-style-type: none"><li>-Significant contributions to concepts, designs, practices, analysis and interpretation of data <input checked="" type="checkbox"/></li><li>-Participants in Drafting and Revising Papers <input checked="" type="checkbox"/></li><li>-Someone who can explain all aspects of the paper <input checked="" type="checkbox"/></li></ul>

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Corresponding author\*  
E-mail: jaebumlee@mju.ac.kr

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## Utilization of Microcurrent Care Device for Health Intervention and Beauty Care

Dogyeong Lee<sup>1</sup>

Myongji University, Seoul, Republic of Korea

Jaebum Lee<sup>2\*</sup>

Myongji University, Seoul, Republic of Korea

### Abstract

**Purpose:** Korea's beauty and health industry has continued to change and develop beyond simple appearance care into the area of health intervention. Accordingly, this study was conducted to confirm the mechanism of application of device using Microcurrent Technology to the human body and various management methods. In addition, the purpose of this study was to find out how Microcurrent device is being used for health interventions in modern people.

**Method:** In this study, we investigated previous research related to microcurrent, health intervention, and beauty care published until recently in PubMed, Google Scholar, and Korea Research Information Sharing Service. Among them, a literature review was conducted on papers judged to be deeply related to the content of this study.

**Results:** In Korea, devices that use Microcurrent Technology are still being used interchangeably without an exact definition. The reason for this is that we are in a transitional period from medical device to beauty device. In this study, the device for skin care and health intervention was defined as Microcurrent Care (MCC), and the mechanism of application to the human body was confirmed. In addition, the method of using and safety management of the MCC device was also presented.

**Conclusion:** In Korean society, as the beauty industry continues to change and develop into an area that improves health and quality of life, the range of use of MCC devices is gradually expanding. In this study, the understanding and utilization areas of MCC devices were identified for the development direction of K-beauty, and suggestions were made for long-term success and sustainability.

**Keywords:** Health Intervention, Microcurrent, Device, Application, Sustainability

## 1. Introduction

Health interventions refer to various programs and actions to evaluate, maintain, and improve an individual's health status[1]. It is systematically planned and implemented to improve the quality of public health and solve health-related problems. In Korean society, health intervention can be applied differently depending on various factors such as economic, educational, and social factors. In particular, it is used as an important means to solve health inequality problems and refers to efforts to improve the health of individuals or communities. In other words, it emphasizes a preventive approach to maintain and improve health, and for example, regular exercise, healthy eating, and stress management are considered as health promotion [2][3][4].

Health promotion refers to health-related behaviors that aim to prevent disease and improve overall health and focus on personal and environmental factors that determine individual be-

havior. Against this background, health promotion has become an essential element in improving an individual's quality of life, and various technological approaches are being researched to support this. On the other hand, health interventions focus on the diagnosis and treatment of specific health problems and include medical treatment, drug treatment, and surgery [5]. In particular, thanks to technological advancements, the use of microcurrent technology in the medical and health care fields is making notable progress, and its possibilities are gradually expanding.

Electric current has long been used for medical purposes, such as relieving pain in the human body and stimulating muscles. Physiological treatments using electricity continue to develop and contribute to providing sophisticated health solutions. Accordingly, this study focuses on how microcurrent affects modern people's health interventions and also investigates the current status and future possibilities of innovative health management solutions provided by microcurrent technology.

This study conducted a literature review to analyze the applicability and effectiveness of microcurrent technology in the health care field from various angles. As a method of researching overseas academic papers, we used the PubMed and Google Scholar databases to search for academic papers related to microcurrent technology over the past 5 years (2019-2024). The researcher checked papers published in academic journals in the US, Germany, France, UK, Japan, etc. through PubMed, and selected additional papers focusing on applied science and clinical research through Google Scholar. To investigate research trends in Korea, research papers on microcurrent technology were reviewed through the Korea Research Information Sharing Service. These prior studies span a variety of topics, including health promotion, skin care, and musculoskeletal rehabilitation, and contain research results on the application of microcurrent technology in the fields of medicine and engineering.

## 2. Mechanism of Application of Microcurrent to the Human Body

There is a view that the history of electrotherapy began in 1836 when Bird of England opened the first electrotherapy department at Guy's Hospital in London. At the time, research results were published showing that electrical stimulation promotes fracture healing, and since then, electrotherapy has been used in the medical community to treat fractures, muscle and ligament damage, and skin wounds. In particular, microcurrent stimulation has been proven to be effective in reducing pain, promoting wound healing, and improving muscle strength, and is widely used in rehabilitation treatment.

Recently, research results have reported that electrical stimulation is also helpful in nerve regeneration and functional recovery [6]. The intensity a person feels varies depending on the size of the current. The following <Table 1> shows the intensity of the human body's response according to the size of the current, <Table 2> is a classification according to the size of the current, and <Table 3> shows the electrotherapy method according to the purpose of treatment.

**Table 1.** Human body response according to the magnitude of current [7].

Intensity of passing current (mA)	1mA	5mA	10mA	15mA	50-100mA
Symptom	A slight feeling of electrical stimulation	convulsions	Anxiety and muscle contractions	strong cramps Causes (muscle paralysis)	serious injury or death

**Table 2.** Human classification according to the magnitude of current[8].

Microcurrent	Low frequency current of 1~20Hz
Low frequency	Current with a frequency of 1 to 1,000 Hz or less
Mid frequency	Uses currents with a frequency range of 1,000 to 10,000 Hz by interfering with each other.
High frequency	Current with a frequency of 100,000 Hz or more
Ultrasonic wave	Current with frequency above 20kHz

**Table 3.** Purpose and content of various electrotherapy uses[9].

Purpose of use	Main Content
Pain relief	Transcutaneous electrical nerve stimulation; TENS Interference current; ICT High voltage galvanic stimulation; HVGS Silver spike point; SSP Microcurrent; MC
Increased muscle strength	Denervation muscle Electrical muscle stimulation; EMS Innervated muscles Neuromuscular electrical stimulation; NMES functional electrical stimulation; FES Russian current; RC Interference current; ICT High voltage galvanic stimulation; HVGS
Tissue therapy	Microcurrent; MC Low intensity direct current; LIDC High voltage galvanic stimulation; HVGS Electrical field stimulation; EFS

Microcurrent refers to a weak current in the unit of Microampere ( $\mu\text{A}$ ), which is a current lower than 1mA. Therefore, microcurrent stimulation is classified in  $\mu\text{A}$  units, and a low current of approximately  $40\mu\text{A}$  to  $60\mu\text{A}$  moves in the human body[10]. When a microcurrent stimulus similar to this size is applied to the body, cell activation through positive and negative ion channels formed inside and outside the cell membrane, blood flow improvement, ATP increase for muscle contraction and nerve transmission, and protein synthesis become active[11]. In addition, it is attracting attention as a safer and more effective method than existing electrical therapy because it helps tissue recovery such as skin, muscles, ligaments, and tendons by promoting collagen synthesis as blood flow increases[12].

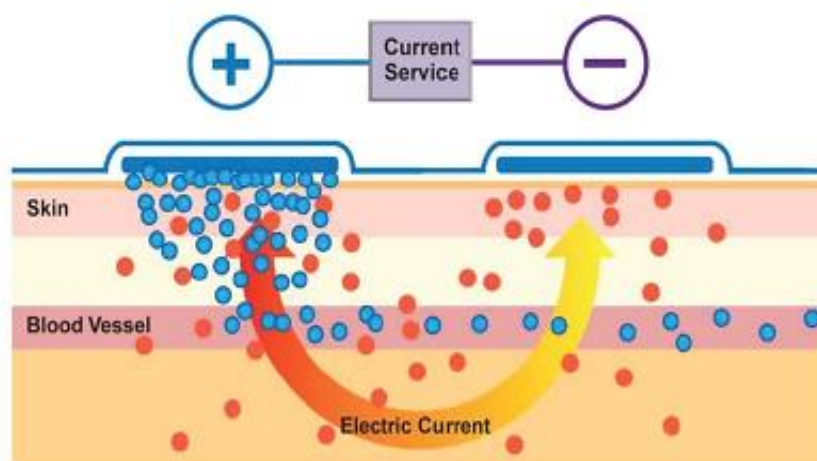
Previous research on human application in this regard includes a study that demonstrated that microcurrent is effective in improving dermal density and skin elasticity, and a study that showed that increased ATP concentration and production increased skin collagen production, thereby reducing facial lifting and wrinkles[13]. It is reported that microcurrents apply microcurrents ranging from 1 to 999  $\mu\text{A}$  at a frequency of 0.5 Hz to 100 Hz, so the possibility of side effects is significantly lower than that of conventional electrotherapy[14].

There are approximately 60 to 100 trillion cells in the human body, and electrical signals and transmission of cells occur through electrical impulses generated from these cells, thereby maintaining vital activities. The human body's biological current is closely related to nerve and

muscle activity, flows between all organs and tissues of our body, and plays an important role in cellular activity. Bio-current is mainly related to nerve and muscle activity, and plays an important role in cell activity as it flows between all organs and tissues in our body. A fundamental aspect of all biological processes is mainly generated by the movement of ions (sodium, potassium, calcium, chlorine, etc.) through cell membranes[15].

Like electrocardiography, bioelectric current is used in research to evaluate the state of the body or treat disease by converting the bioelectric current within the body into a graph, measuring and analyzing it. In other words, it is used to evaluate biological conditions or treat and research diseases by measuring and analyzing various electrical signals such as promoting blood circulation, relieving pain, and recovering from fatigue. It is also one of the topics that plays an important role in the medical field and biological research[8]. It is said that as humans age, the amount of biological current gradually decreases, which can lead to symptoms such as muscle cramps, numbness in the hands and feet, and headaches. However, it has been reported that externally providing electrical stimulation to the human body to supplement bio-current can enhance cell regeneration and help improve various diseases or symptoms[16].

**Figure 1.** Principle of microcurrent stimulation[9].



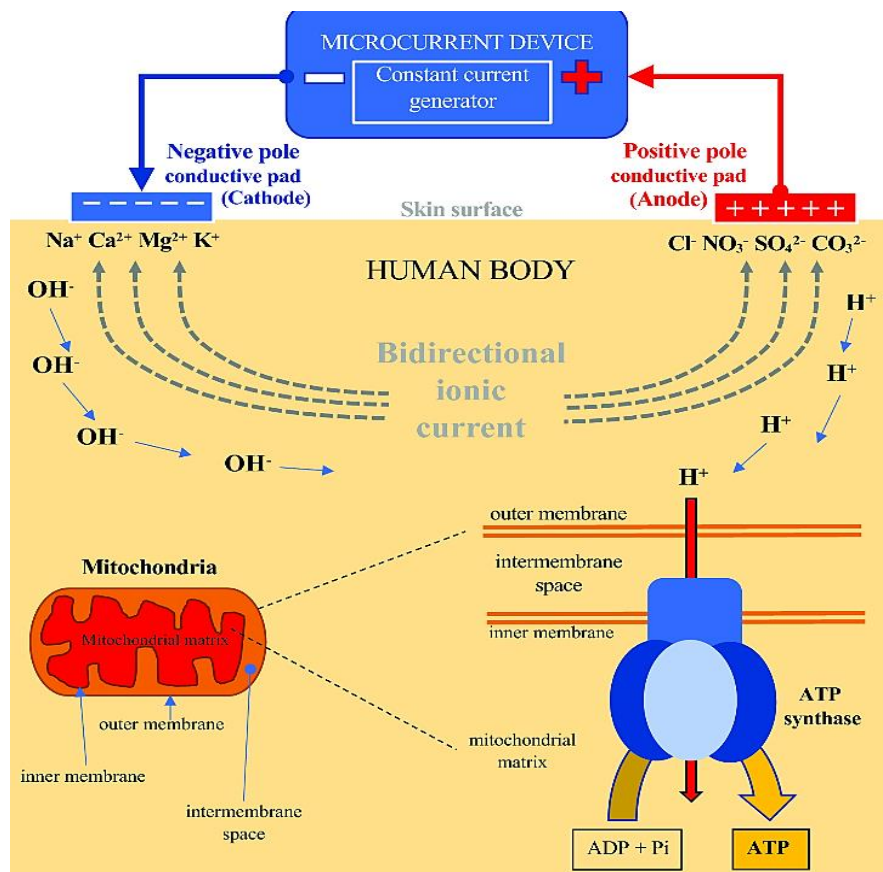
An important part of using bio-current for beauty & healthcare is to utilize the functions performed within skin cells to ensure that the active ingredients contained in cosmetics are well absorbed into the skin layer. In order to pass through the barrier existing in the skin layer, simple diffusion and accelerated diffusion must occur depending on the concentration of moisture, and the ingredient molecules of cosmetics must be ionized to cause electrophoresis. Various lifting devices used as skin care equipment perform these roles, and equipment used for peeling purposes causes peeling to bind ions present in the stratum corneum of the skin. <Figure 1> explains the principle of microcurrent stimulation. All biological tissues show an electrical response when stimulated, and cells and tissues respond broadly to external electric forces and even emit electromagnetic forces themselves[17].

### 3. Effects of Microcurrent Devices Applied to the Human Body

Microcurrent devices work when a cell needs energy, ATP releases energy by breaking the bond between phosphate groups and decomposes into ADP and inorganic phosphate. It mainly occurs during respiration using mitochondrial oxygen, and ATP is also produced through glucose decomposition and photosynthesis. This is the basis for the mechanism of improving blood flow,

improving tissue and nerve cell function, and promoting recovery through microcurrent devices[18]. It is also effective in reducing inflammation and pain in the body, and is known to promote cell growth, improve skin moisture and elasticity, and help recover aged skin cells. In particular, microcurrent devices are known to help regeneration by promoting the regeneration of cartilage cells in the treatment of osteoarthritis, and do not cause muscle contraction, so there are few side effects and excellent safety even when used for long periods of time[16][17]. <Figure 2> shows a method of inducing ATP formation by applying microcurrent to the skin layer.

**Figure 2.** Induction of ATP formation by microcurrent application[14].

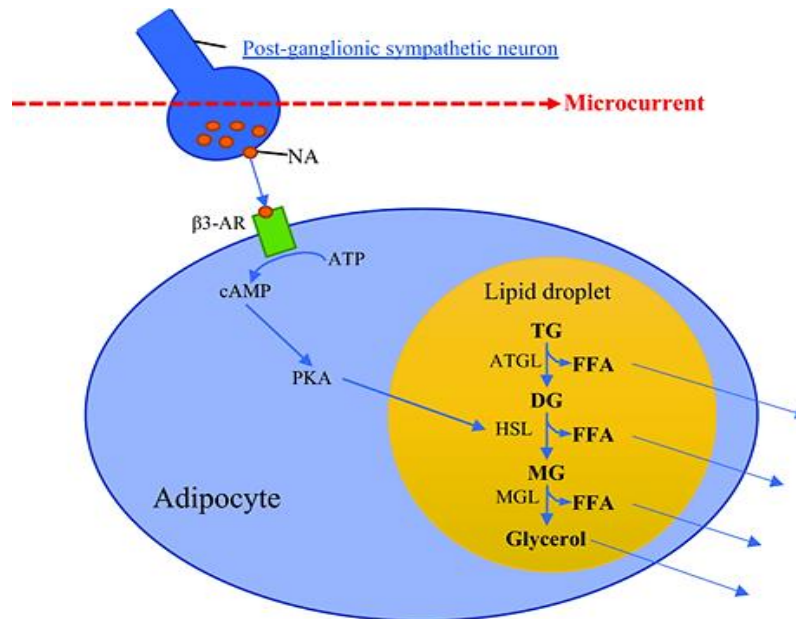


Recent studies claim that stimulation through a microcurrent device can induce skin collagen production and has the effect of improving skin elasticity. It is also used in beauty care for facial toning and reduction, and may have an improvement effect[17]. Microcurrent devices can be effectively used to reduce pain, treat chronic pain, and accelerate the healing process of soft tissue damage and wounds. It is reported that it promotes rapid regeneration of damaged tissues by stimulating cell activity, increases blood flow through blood and lymph circulation, and helps reduce inflammation[16]. Previous studies on the effect of microcurrent on fat decomposition in the human body have reported that when used in parallel with 30 minutes of endurance exercise and the 25-50Hz frequency of a microcurrent device, it can have a positive effect on reducing visceral and abdominal fat[4]. <Figure 3> explains the mechanism of fat decomposition by microcurrent.

Delayed-onset muscle soreness (DOMS) caused by exercise has been explained by several factors, including impaired calcium balance and muscle fiber destruction. In particular, the deep fascia is closely connected to the underlying skeletal muscles, so damage, micro-tears, and inflammation may occur during unfamiliar intense exercise bouts and may cause perceived discomfort after exercise[14]. In a study on the effectiveness of microcurrent devices in promoting

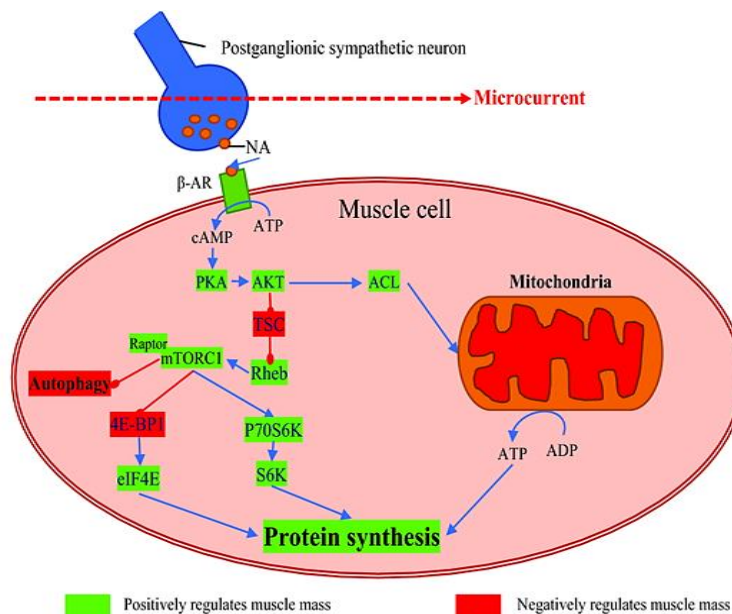
recovery and reducing the severity of muscle damage symptoms, it was reported that they reduced the severity of DOMS in a double-blind placebo-controlled trial in healthy men[19].

**Figure 3.** Mechanism of lipolysis by microcurrent[14].



Another study claims that the use of microcurrent devices is effective in recovering from nerve injuries and treating certain neurological diseases, and is also effective in reducing cumulative fatigue[20]. Microcurrent using overlapping frequencies has been proven to be effective in improving cognitive ability in Alzheimer's disease mice, so it is expected that it can be applied as a non-pharmacological method for prevention and treatment[21]. <Figure 4> explains the mechanism for muscle protein synthesis using microcurrent.

**Figure 4.** Muscle protein synthesis by applying microcurrent[14].



In addition, a study conducted on rabbits showed that applying a microcurrent device for 60 minutes every day for 2 weeks could have a regenerative effect on the atrophied gastrocnemius muscle. In particular, it was said that the low-intensity (20 $\mu$ A) Microcurrent device protocol promoted muscle regeneration more than the high-intensity (5000 $\mu$ A) protocol, showing that the low-intensity protocol was effective[22].

#### 4. New Expansion and Safety of Microcurrent Devices

In previous research, MCT, which stands for 'Microcurrent Therapy', is introduced as a non-invasive and safe electrotherapy method that uses a weak current of less than 1mA, similar in size to the biological current that naturally occurs in the human body, and is used in the medical and rehabilitation fields[18]. MCT is effective in muscle and tissue recovery, pain relief, and inflammation reduction, and is used to treat musculoskeletal problems, neurological conditions, and pain management. It is mainly administered by medical professionals and is used as part of a customized treatment plan that takes into account the patient's specific conditions.

Currently, in Korea, the majority of skin care devices have obtained the KC (Korea Certification) mark, are classified as industrial products, and are sold with permission. KC refers to a single certification that integrates 13 statutory mandatory certification systems that were originally used differently by Korea's Ministry of Knowledge Economy, Ministry of Labor, Ministry of Environment, Korea Communications Commission, and National Emergency Management Agency, including safety, health, environment, and quality.

Microcurrent devices mainly sold in the skin care industry include steamers, magnifying glasses, lifting devices, vibrating brushes, galvanic device, high-frequency device, ultrasonic lifting device, skin scrubbers, low-frequency device, vacuum aspirators, ion injectors, endermology, and infrared, color therapy devices using ultraviolet rays and visible light, etc. In addition, many types of beauty devices that are used directly for skin improvement effects and care devices for the whole body, scalp, and hands and feet are sold with KC certification[23].

However, in Korea, there are no unified regulations for the names of skin care device using electrotherapy, and they are used in mixed situations. Accordingly, in this paper, Microcurrent device was named 'Smart Beauty device' and MCC was operationally defined as an abbreviation for 'Microcurrent Care'. Additionally, 'Microcurrent Care for Face' was defined as MCC-F, 'Microcurrent Care for Body' was defined as MCC-B, and 'Microcurrent Care for Face & Body' was defined as MCC-C (Complex). These new definitions and regulations were created to prevent confusion about the use of microcurrent devices and to enable them to be utilized in various fields, and that academic definitions of their meaning were also needed.

Recently, in Korea, MCC device is being released in various forms in line with modern trends. In addition to microcurrent, advanced technologies such as RF, ultrafine ultrasonic waves, application of thermal far-infrared rays to brass, and mineral far-infrared radiating ceramic heaters are being applied. These devices are actually used for youthful facial care, contour care, skin elasticity, wrinkle reduction, skin improvement and scalp care, muscle strengthening, relaxation, detoxification and stress relief. In the medical field, MCC device is mainly seen in rehabilitation centers for pain management, muscle rehabilitation, and physical therapy to help recover after surgery, and is also being actively used in skin specialty hospitals for cosmetic purposes.

In the skin care industry, MCC device is known as a non-invasive method and has been approved for use as a non-medical device, so the use of MCC-F, MCC-B, and MCC-C equipment in numerous skin care products is continuously expanding. MCC device represents K-Beauty as a cutting-edge approach to beauty, health, and home care, and is widely used in the field of

Beauty & Healthcare. The following <Figure 5> presents representative MCC-F, MCC-B, and MCC-C.

**Figure 5.** Representative MCC-F, B, C device[24][25].



Research on the safety of MCC device shows that there are only very few side effects, so it is generally reported as a safe treatment. A meta-analysis on the use of MCC to reduce musculo-skeletal pain also concluded that there were no serious side effects of microcurrent application, and a study examining safety and efficacy concluded that it only caused mild tingling in the feet and was resolved without seriousness. It has been reported as a safe treatment in various medical situations for decades. No side effects were reported in recent acute and long-term intervention studies targeting the general population and the elderly, and the results suggest that MCC is a safe treatment method for healthy people, athletes, and the elderly [19]. However, before using MCC device, it is important to follow the manufacturer's instructions exactly and fully understand the usage method before using it safely [26]. The following <Table 4> presents precautions when managing MCC device.

**Table 4.** Purpose and content of various electrotherapy uses[9].

Precautions when managing microcurrent		
1	Expert consultation	Consult with an expert before starting treatment.
2	Check skin condition	Do not use if your skin has wounds or inflammation.
3	Pregnancy	Do not use during pregnancy.
4	Heart disease	Caution for those with heart disease
5	If there is a metal object	Do not use if you have metal substances in your body.
6	Low blood pressure	Patients with low blood pressure should consult a specialist before use.
7	Avoid areas at risk for infection	Do not use on areas at risk of infection.
8	Cancer patients caution	Cancer patients should consult a specialist before use.
9	Avoid excessive use	Do not use for more than the recommended time and frequency.
10	Avoid sensitive areas	Do not use on sensitive areas.

11	Electric shock hazard	Be careful as there is a risk of electric shock when using the device.
12	Regular inspection of device.	Inspect and maintain device. regularly.
13	Not for use by children	Do not allow children to use the device.
14	Beware of allergic reactions	Discontinue use if you have an allergic reaction.
15	Know how to use the device.	Understand and follow the device. usage instructions accurately.
16	Discontinue if side effects occur	If side effects occur, discontinue use and consult a specialist.
17	keep clean	Always keep device. and treatment areas clean.
18	Be careful when pain occurs	If pain occurs during treatment, stop immediately.
19	Maintaining administrative cords	Create and maintain accurate management records.
20	Health information consent form	Complete the health information consent form.

## 5. Conclusion and Recommendations

The Korean beauty industry is continuing to change and develop beyond appearance care into an area that improves health and quality of life, and is developing personalized services and products by combining cutting-edge technologies such as digital-based AI, big data, and IoT. It continues. Changes and innovations in various aspects, such as building efficient work areas, are recognized as important characteristics and new trends in the Korean beauty industry [27].

Modern people's mental health problems are related to stress, and one aspect of psychological well-being is linked to body image [28]. It has been confirmed that people who receive regular Beauty & Health care have lower stress perception and positive body image, and healthy beauty improves the interaction between confidence and social skills, helping success in work and interpersonal relationships [29][30]. In this respect, the beauty health industry is leading to the development of beauty content, giving importance and value in various aspects such as providing personalized services, improving convenience, strengthening brand competitiveness, and enhancing sustainability. The perception that beauty management behavior is exclusively for women is disappearing and is occurring across all generations. It is said that the pursuit of beauty is a positive expectation of oneself and can influence constructive self-development in many aspects of life [31][32][33]. Therefore, it is time to develop new beauty content in line with the changing modern society.

Looking at previous research on recent beauty & health trends, new words such as slow aging and conscious beauty are emerging, and it appears that these are being passed down to the older generation, Generation X, including the MZ generation. Specifically, it has been found that in order to maintain healthy beauty, eco-friendly factors are considered in the materials and ingredients of products and that sustainable beauty management behaviors are pursued. This consumption trend is driving a shift in awareness of beauty care, which claims that it can increase psychological stability and work ability and have a significant impact on self-development [34][35]. MCC device is attracting increasing attention in the beauty & health field. However, objective evidence regarding safety and effectiveness is still lacking. Therefore, long-term clinical research and meta-analysis are needed, and MCC content needs to be structured based on this. In the future, scientific and objective research on the use of MCC device is expected to play an important role in health interventions for modern people.

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## 7. Appendix

### 7.1. Author's contribution

	Initial name	Contribution
Lead Author	DL	<ul style="list-style-type: none"><li>-Set of concepts <input checked="" type="checkbox"/></li><li>-Design <input checked="" type="checkbox"/></li><li>-Getting results <input checked="" type="checkbox"/></li><li>-Analysis <input checked="" type="checkbox"/></li><li>-Make a significant contribution to collection <input checked="" type="checkbox"/></li><li>-Final approval of the paper <input checked="" type="checkbox"/></li><li>-Corresponding <input checked="" type="checkbox"/></li><li>-Play a decisive role in modification <input checked="" type="checkbox"/></li></ul>
Corresponding Author*	JL	<ul style="list-style-type: none"><li>-Significant contributions to concepts, designs, practices, analysis and interpretation of data <input checked="" type="checkbox"/></li><li>-Participants in Drafting and Revising Papers <input checked="" type="checkbox"/></li><li>-Someone who can explain all aspects of the paper <input checked="" type="checkbox"/></li></ul>

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