

Protection Convergence

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Usefulness of the Green Coffee Bean Fermented Product as a Cosmetic Material for Scalp Hair Protection

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Abstract

Purpose: The population experiencing hair loss has increased given the stress, environmental pollution, and the various cosmetic procedures, and the functional cosmetics market for the scalp hair care is further expanding due to the aging population. However, side effects such as allergies have occurred, and the interest in environmental pollution is rising. Recently, many studies have been conducted to search cosmetic raw materials from natural substances or applied fermentation techniques to the cosmetic manufacturing process. Accordingly, the green coffee beans which are edible and have been used for various pharmacological functions for and by the private sector for long and have secured clinical safety were fermented, then the active ingredients and effectiveness (in vitro) were investigated.

Method: After fermenting the green coffee beans which are known to be effective for the scalp hair health by using EM, and preparing a sample using a double fermentation method of enzyme fermentation with malt, active ingredients (caffeine, polyphenol, flavonoid, and sugar) and effectiveness (in vitro, antioxidant activity, anti-inflammatory activity, and the dermal papilla cell growth rate) were verified.

Results: As a result of the experiment, the caffeine and sugar content increased during the EM fermentation and enzyme fermentation, and there was no difference discovered according to the enzyme fermentation temperature. The total polyphenol and the total flavonoid content decreased during the enzyme fermentation, and enzyme fermentation at 60 °C of EM fermentation solution of green coffee bean extracts demonstrated an excellent rate of anti-inflammatory activity and dermal papilla cell growth.

Conclusion: It was verified that the fermented product of the green coffee bean double fermented by using EM and malt has an excellent rate of antioxidant, anti-inflammatory, and dermal papilla cell growth, and hence, it may be applied as a raw material for various cosmetics. In particular, it was verified that it is effective for the scalp and hair health, while the usefulness as a cosmetic material for scalp hair was also verified.

[Keywords] Green Coffee Bean, EM Fermentation, Enzyme Fermentation, Hair Loss, Protection

1. Introduction

1.1. Need and purpose of the study

Given the recent exceptional economic growth and industrialization achieved, the quality of life of modern people has significantly improved, and the average life expectancy has also increased, while the perception of a healthy body and beauty has changed, and the food, health, and pharmaceutical industries are demonstrating such a high rate of growth[1]. Accordingly, in the cosmetics industry, the preference for eco-friendly, organic, well-being, and natural cosmetics has becoming apparent[2], and such changes of the market are upgraded and evolving towards the era of bio-cosmetics[3]. Furthermore, modern people are threatened with the scalp and hair health not only due to the genetic factors or natural hair loss including aging, but also

due to such external factors as increasing pollutants, ultraviolet rays, stress, and the western habits of eating.

The scalp discharges waste to the outside of the body through pores, sweat and sebaceous glands and also plays an important role in balancing the oil and moisture of the skin, and hence, an excessive secretion of sebum and sweat can clog pores or even cause bacterial growth, which may further cause various scalp diseases such as ringworm and hair loss. Hence, the scalp care is very important not only in terms of beauty but also in medical terms[4]. Accordingly, many studies have been conducted for the scalp hair care products, yet there are also side effects including irritation of the scalp or negative effects such as toxic residues which damage the scalp or cause hair loss[5]. In recent years, studies have been conducted to search for the substances useful for the scalp care targeting natural products[6][7][8]. Accordingly, in this study, green coffee bean, which is edible and has been used for various pharmacological functions for and by the private sector for long, was fermented as the main ingredient and was sought to be fermented to help reduce environmental pollution and find a clinically safe cosmetic raw material.

1.2. Theoretical background

1.2.1. Scalp and hair loss

Skin is a membrane which covers the outside of the body and also occupies an important part of the primary immune defense system which protects the body from against various environmental factors, and the part which covers the head is called scalp. While the scalp is thin, there is the root of the hair, which is the foremost line of defense which protects the skull, and has the function of generating, growing, and maintaining hair. Furthermore, since it is a very important part in terms of skin beauty, such as being connected to the skin of the face and neck and having a great influence on the formation of skin wrinkles[9], beauty devices which are effective for hair by caring for the scalp have also been released[10].

Hair operates as a barrier to help protect the skull, functions as an excretory organ which discharges waste products through the hair root, protects the head from against external stimuli including the direct sunlight and physical friction, and is also involved in maintaining the body temperature. As an organ, it protects the head from external shocks, ultraviolet rays, cold and friction, and also performs the function of absorbing and discharging any unnecessary heavy metals from within the body[11]. Hair is generated from the hair root of the scalp and is not always attached to the scalp, yet undergoes a process of growth and exfoliation at a constant rate[12], which is called 'hair cycle'. When over 200 counts of hair fall out per day, it is called an abnormal hair loss and is also a condition which requires care. The abnormal hair loss occurs when the hair growth cycle is shortened, the number of telogen follicles increases, and the hair loss occurs excessively, and it also is widely known that it surfaces for various reasons including nutritional condition, stress, imbalanced action of male hormones, and genetic factors[13]. In particular, it is classified into the male-type hair loss, female-type hair loss, circular hair loss, and the infectious hair loss according to the cause and type[14]. The most cited causes of hair loss are genetic factors, aging, and blood circulation disorders. Among the substances which perform the function of signal transduction in the body, the chemical which commands the hair follicle to start the growth or resting phase is 'Superoxide Radical', and the signaling substance which commands the start of the growth phase is 'Nitric Oxide', and hence, in terms of studying the development of therapeutic agents which may be applied to the areas of hair loss, many studies have been conducted at and by the FDA as to how to lower the level of Superoxide Radical by using the Super Oxide Dismutase (SOD)[15].

1.2.2. Natural product fermented cosmetics

Carotenoids, cellulose, phenolic compounds, and flavonoid substances contained in the natural plant extracts help improve the health and beauty as the eco-friendly and physiologically active materials with antioxidant, anticancer and antibacterial effects, and are also utilized as the materials for promotion and useful materials for food, medicine, and cosmetics [16][17][18]. As the physiologically active ingredients of plants which have been used for long as medicines by and for the private sector have been scientifically proven, active ingredients are concentrated or separated from the plants and are used as materials for hair cosmetics, and accordingly, previous studies using natural products have been reported [19][20][21]. Fermentation refers to the action of microorganisms to help produce the substances beneficial for the humans using organic substances [22], and when fermentation occurs, the physiological activities of the natural substances are maximized. Furthermore, the substances which have undergone the fermentation process are used for a variety of industries, including food, cosmetics, feed, and pharmaceuticals, since they have beneficial effects on the humans, such as by activating the nutrients contained therewithin, improving absorption, and by neutralizing the harmful bacteria and toxins. Furthermore, there is a report which claimed that the elimination and anti-inflammatory effects of nitrites have increased [23], and that the yellow lacquer extract further inhibits the activities of pathogenic microorganisms after fermentation [24]. According to the study, when the fermented extracts or substances produced during fermentation were applied for the skin, antioxidant, moisturizing, and cell activity turned out to be excellent, while side effects were relatively few and safety as a cosmetic raw material was excellent, and it was also reported that it demonstrated such a high antioxidant power and increases the efficacy of cosmetic ingredients and transdermal absorption [25].

1.2.3. Coffee

Coffee tree is affiliated with *Coffea* and with *Rubiaceae* family, and there are approximately 70 species within *Coffea*. Representative of coffee tree are the *Coffea arabica*, *Coffea canephora* and the *Coffea liberica* [26]. Coffee has been identified as an antioxidant, and the Fischer's team has demonstrated the therapeutic potential of hereditary hair loss by finding that caffeine promotes the humans' hair growth *in vitro* from approximately 600 human hair roots taken from the humans [27]. Furthermore, Bussoletti et al. reported that caffeine shampoo and lotion were effective for the androgenic hair loss syndrome (AGA) [28]. There were also studies which claimed that caffeine, which is an alkaloid, offers a very strong antioxidant action and is helpful for hair growth by inhibiting the activities of 5 α -Reductase [29].

1.2.4. EM and malt

Effective microorganisms (EM) is the term for a microbial material developed in 1983 by Dr. Higa of Japan for the purposes of soil improvement and natural organic farming. In general, microorganisms including malt, yeast, lactic acid group, actinomycetes, and photosynthetic bacteria, etc., which have been used for fermentation by the mankind for long are included, and such microorganisms produce antioxidants, symbiotically with each other, and inhibit decomposition. EM is also widely known for its excellent antioxidant effect, and is an eco-friendly material, and hence, it is widely used across various fields. The advantages of EM include the ability to sterilize and purify air to remove odors and purify water. Furthermore, it is relatively safe to handle, and hence, one can easily make and use detergents or cosmetics domestically as an DIY, and the edible EMs also sold. For such reason, studies of EM are conducted very actively, and there is also studies on the development of cosmetics for the scalp hair containing EM to prevent and improve hair loss by improving the conditions of scalp.

Malt is a material which has traditionally been used for saccharification when making 'Shi-hye'. Malt refers to a product made into a powder after sprouting the outer barley and drying

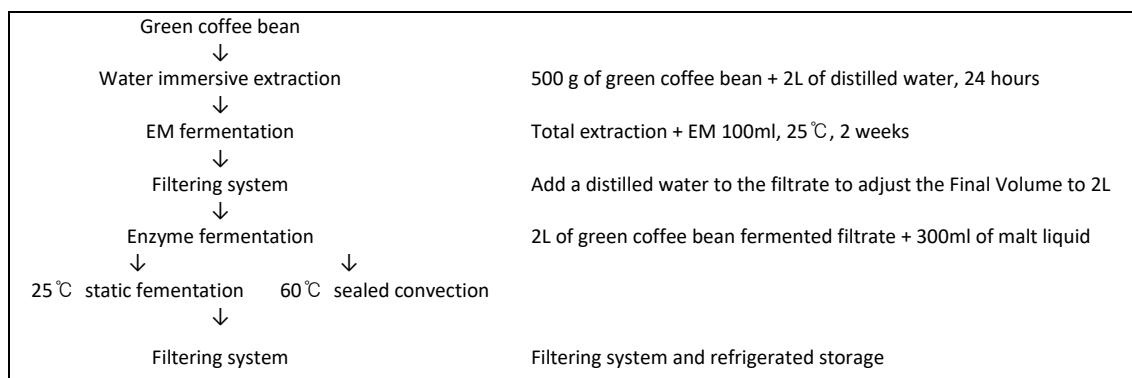
it. It is also called gilgeum powder or malt, and contains a lot of various enzymes and minerals such as saccharification enzymes of Glucoamylase, α -Amylase, β -Amylase, and a wealth of calcium[30]. In particular, α -Amylase is an enzyme which hydrolyzes α -1, 4 bonds in starch, and is not present in barley in the idle state, yet is produced during germination. Moreover, when barley is germinated, GA3 (gibberellic acid), a substance similar to gibberellin, is produced to help enzyme activity. Malt is widely known to have excellent antioxidant effect and is a good source of GABA. Furthermore, there are studies which claimed that the saccharification varies depending on the length and variety of the first leaf of malt, and there are also studies which reported that the lactic acid bacteria fermented cheonma saccharified by using malt turned out to have the best acceptance[31].

2. Method

2.1. Fermentation experimentation method

The fermentation experimentation method of green coffee bean is as follows. <Figure 1>

Figure 1. Fermentation experimentation method.



500g of green coffee bean were immersed in 2L of distilled water, and extracted at room temperature for 24 hours, then the whole amount was used for fermentation. The extract was inoculated by mixing 100 ml of EM solution, and incubated in an incubator at 25°C. for approximately 2 weeks. After the EM fermentation was completed, it was filtered and sterilized, and a distilled water was added to adjust the final volume to 2L, followed by the secondary enzyme fermentation. After mixing 300 ml of malt solution with 2L of the coffee's EM fermentation filtrate, enzyme fermentation was performed under the 2 conditions of 25 °C (2 weeks, stationary) and 60 °C (6 hours, sealed convection). After the enzyme fermentation was completed, it was filtered with sterile gauze, then stored in a refrigerator for use for the experiment.

2.2. Active ingredient analytical method

The caffeine's content analysis was performed in accordance with the Food Code Article 8. General Testing Method 10. Food Labeling Related Testing Method 10.4 Caffeine related testing method. First, the sample was diluted to an appropriate concentration, passed 5 ml of it through the reverse-phase cartridge at a rate of 3 to 4 ml per minute, then the solution eluted with 15 ml of the mobile phase solution was used as the test solution and analyzed by liquid chromatography. As for the standard reagent, caffeine (Sigma) was used for analysis by HPLC, and a standard curve was prepared and quantified accordingly.

The polyphenol and flavonoid contents were measured by applying the Folin-Denis method. Polyphenols are among the representative antioxidants discovered in plants, and when Pauline reagent reacts with polyphenols, it turns blue. The concentration of polyphenols is determined

by the intensity of blue, and the darker the color, the higher the concentration. Flavonoid is a type of polyphenol, and the detection principle is the same as that of polyphenols. Tannic acid and Naringin were used as standards, each respectively, and absorbance was measured to prepare and quantify a calibration curve.

The total sugar content was measured by applying the DNS method. Maltose was used as a standard, and a calibration curve was prepared and quantified by measuring absorbance.

2.3. Effectiveness analytical method (In vitro)

2.3.1. Antioxidant experiment

As for the DPPH radical elimination, the DOJINDO Laboratories Kit was used. The absorbance was measured after the sample was left standing alone by adding the Assay Buffer and the DPPH working solution. The DPPH's radical elimination was analyzed by comparing it against the IC₅₀ of Trolox Standard, and was also calculated as the ratio of IC₅₀ of Trolox to IC₅₀ of the sample, and was expressed with the Trolox Equivalent Antioxidant Capacity (TEAC).

As for the SOD activity, the DoGenBio assay kit was used. After adding the sample, working solution, and the enzyme working solution, and after it was left standing alone, and if the color of e turned dark, a blank was set according to the concentration of each sample to correct the activity, and the inhibition rate was expressed as a percentage, and the activity was obtained by taking a 50% inhibition rate (IC₅₀).

The HaCaT cytoprotective effect concerning the oxidative stress caused by H₂O₂ at the cellular level was measured by modifying the CCK-8 method. After culturing the HaCaT cells for 24 hours, a culture solution containing H₂O₂ was administered to react for 24 hours, and the change in the absorbance was measured after reaction by adding the CCK-8 solution, and the cell viability relative to the control was expressed as a percentage.

2.3.2. Cytotoxicity

Prior to the anti-inflammatory activity test conducted, a cytotoxicity test was performed to determine the concentration of the sample which does not cause toxicity to cells. Toxicity for the cells was analyzed by the CCK-8 method. The changes in absorbance were measured and cell viability relative to the control was expressed as a percentage.

2.3.3. Anti-inflammatory

Proteins of the cultured cells were quantified by using the BCA reagent and electrophoresed on 10% SDS polyacrylamide gel. They were transferred to the PVDF membrane, the antibody was reacted, and a photograph of each band was taken after the color development.

2.3.4. TNF- α , IL-6 and iNOS expression using the HaCaT cells

TNF- α , IL-6 and iNOS are widely known to cause inflammatory hair loss[32][33]. An experiment was conducted to find out as to whether the anti-inflammatory properties of the prepared samples have had an effect on inhibiting the inflammatory hair loss. In order to compare and analyze the efficacy of inhibiting inflammatory hair loss by simultaneously treating the green coffee bean ferment extracts and LPS (Lipopolysaccharide) in the HaCaT cells cultured for 24 hours, the expression levels of genes causing hair follicle destruction and cell death were compared with the relative quantification. Proteins were quantified by using the BCA (Bicinchoninic Acid) reagent and electrophoresed in 10% SDS Polyacrylamide Gel. The expressed band was transferred to the PVDF membrane, reacted with the antibody, and after color development, photos of each band were taken by using the ChemiDoc.

2.3.5. Dermal papilla cell growth rate

5×10^4 cells/ml of HHDPs cells were divided into a 96 well plate, and the samples were diluted 2-4 times and treated for 72 hours in the unit of 24 hours. After adding the CCK-8 solution and reacting for 1 hour at 37°C and 5% CO₂ incubator, the change of absorbance was measured and the cell viability relative to the control was expressed as a percentage. For the ERK and Akt phosphorylation, the HHDPs cells were cultured for 24 hours, then treated with the ferment extracts and minoxidil, then the absorbance was measured and confirmed by the western-blot.

3. Results

3.1. Abbreviation

* CE : Coffee extract * CEF : Coffee extract fermentation by EM

* CEFE25 : Coffee extract fermentation by EM and enzyme at 25°C

* CEFE60 : Coffee extract fermentation by EM and enzyme at 60°C

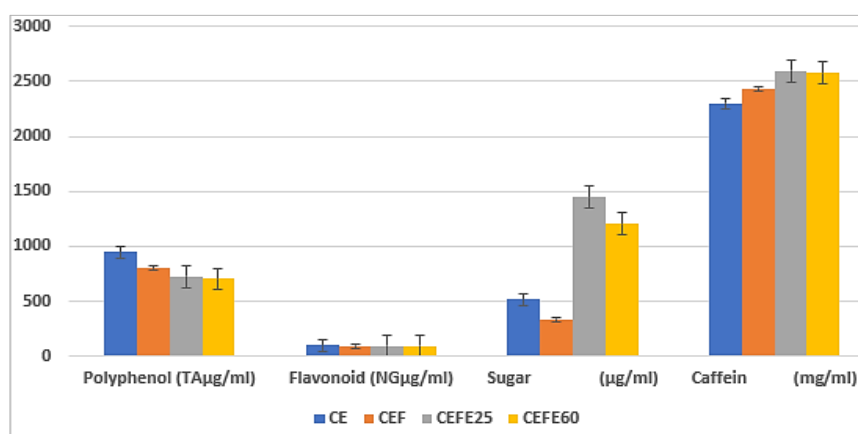
3.2. Fermentation experimentation results

The EM fermented green coffee beans had a fragrant fruity flavor and also had a dark coffee color. Thereafter, the enzyme fermentation was performed by using malt, and different aspects were observed depending on the enzyme fermentation temperature. When the green coffee bean EM fermented product was enzyme fermented at 25 °C, it was light in color and slightly viscous, and when it was enzyme fermented at 60 °C, the color turned out to be darker, and it became very sticky and thick. The recovery rate was over 95% when the enzyme was fermented at 25 °C, and 70% when the enzyme was fermented at 60 °C.

3.3. Active ingredient analytical results

As a result of the analysis of caffeine content performed, it increased by 6% at the end of EM fermentation compared to the green coffee bean extracts. The total polyphenol content in the green coffee bean experiment demonstrated a similar pattern regardless of the presence or absence of EM fermentation, and also decreased during the enzyme fermentation, while there was no difference by temperature. The flavonoid content declined during the EM fermentation, which demonstrated almost no activities during the enzyme fermentation, and there was no difference by temperature. When the EM fermentation of coffee extract was enzyme fermented at 25 °C, the sugar content doubled, and when it was enzyme fermented at 60 °C, it increased by 60%. <Figure 2>

Figure 2. Active ingredients' analytical results.

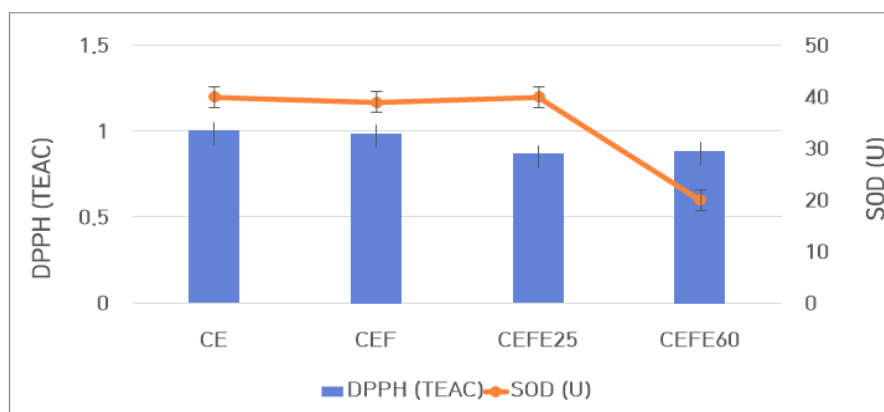


3.4. Effectiveness analytical results (In vitro)

3.4.1. Antioxidant capacity

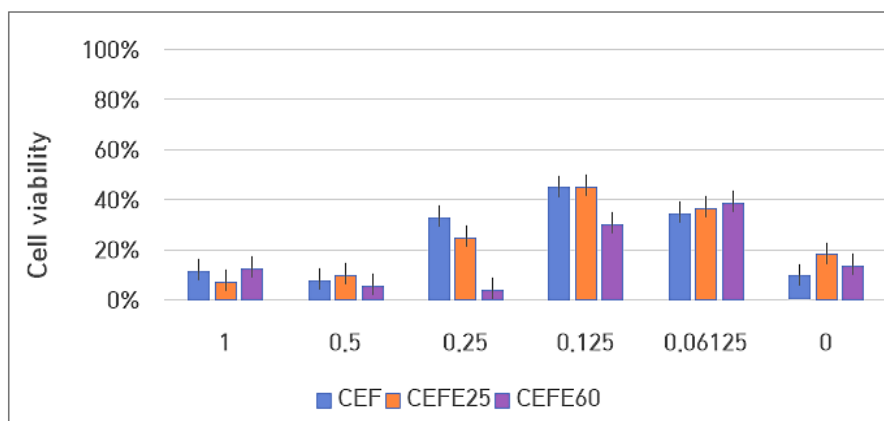
The DPPH radical elimination of the green coffee bean's EM fermented enzyme fermented substance did not demonstrate any significant difference in activity as per the presence or absence of fermentation or the enzyme fermentation temperature. The SOD activity did not significantly change during the fermentation, and also decreased when the enzyme fermentation was performed at 60 °C. <Figure 3>

Figure 3. Antioxidant activities' experimentation results - DPPH radical elimination, SOD activities.



As a result of verifying the HaCaT cell protective effect of the sample under the oxidative stress induced by H₂O₂, it demonstrated the fact that there was a cell protective effect. <Figure 4>

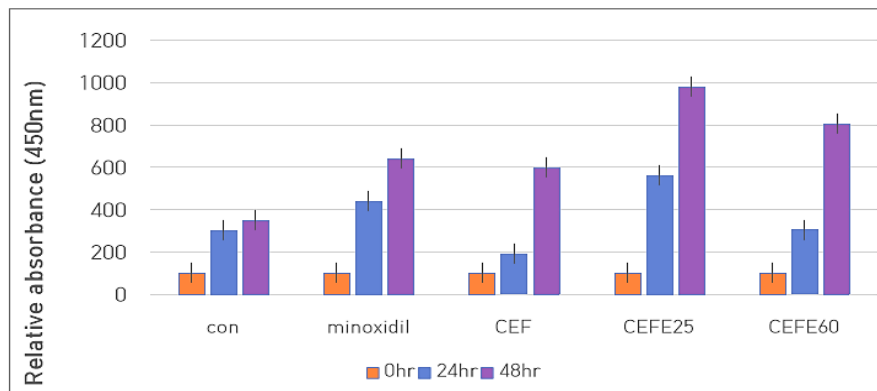
Figure 4. Cytoprotective effect of the fermented coffee bean extracts according to oxidative stress.



3.4.2. Effects on the HaCaT cell growth

It was sought to verify the effect of sample on the growth of HaCaT. Minoxidil (10 μ m) was treated together as the control group, and the effect of HaCaT cell growth according to time was sought to be checked. Compared to the control (distilled water), Minoxidil demonstrated a superior cell growth effect over time, and among the sample treated groups, the 25 °C enzyme fermentation of green coffee bean EM and the 60 °C enzyme fermentation of green coffee bean EM demonstrated a significantly superior cell growth effect than the control group of Minoxidil. <Figure 5>

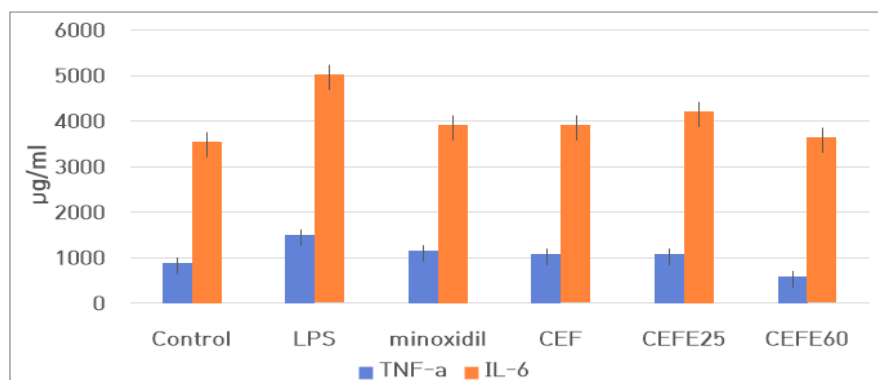
Figure 5. HaCaT cell growth related effect of the green coffee bean fermented product.



3.4.3. Anti-inflammatory

In the group treated with each sample, it was verified that TNF- α and IL-6 were inhibited, and it was also discovered that there was an anti-inflammatory effect. In particular, the TNF- α inhibitory effect of green coffee bean's EM fermentation at 60 °C was significantly superior to that of Minoxidil. In the green coffee bean's EM fermented substance, the iNOS gene was hardly found, which verified the fact that it had an excellent anti-inflammatory effect. Furthermore, the expression level of IL-6 gene was significantly decreased in the 60 °C enzyme fermentation of green coffee bean's EM, and the gene expression of TNF- α significantly decreased in the 60 °C enzyme fermentation of green coffee bean's EM. <Figure 6>

Figure 6. Inhibitory effect of inflammatory cytokines by the green coffee bean fermented product treatment.



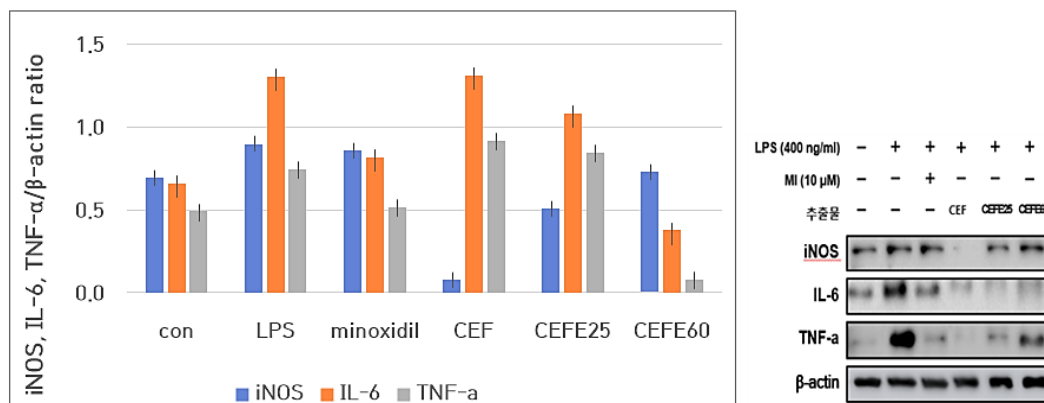
3.4.4. TNF- α , IL-6 and iNOS expression using the HaCaT cells

In order to compare and analyze the anti-inflammatory efficacy of the HaCaT cells incubated with the sample and the LPS treated at the same time, the expression of TNF (Tumor Necrosis Factor)- α and IL-6, which are expressed during inflammation, was verified. It was also verified that the inflammatory cytokines TNF- α and IL-6 increased when treated with the LPS (400ng/ml), and in the group treated with the sample, TNF- α and IL-6 were inhibited compared to the control treated with the LPS. In particular, the TNF- α inhibitory effect of the green coffee bean's EM fermented product at 60 °C, the inflammatory inhibitory effect turned out to be significantly superior to that of Minoxidil.

It was sought to verify the gene expression levels of the inflammatory enzymes of iNOS and the inflammatory cytokines TNF- α and IL-6. As demonstrated by the ELISA results, iNOS, TNF- α and IL-6 increased in the LPS-treated group compared to the control, and also decreased when Minoxidil was treated. In the sample treated cells, it was significantly reduced compared to the

LPS treated group, and in particular, almost no iNOS gene was discovered in the EM fermentation of green coffee bean. The expression level of IL-6 gene significantly decreased in the 60 °C enzyme fermentation of green coffee bean's EM. the gene expression of TNF- α significantly decreased in the 60 °C enzyme fermentation of green coffee bean's EM. <Figure 7>

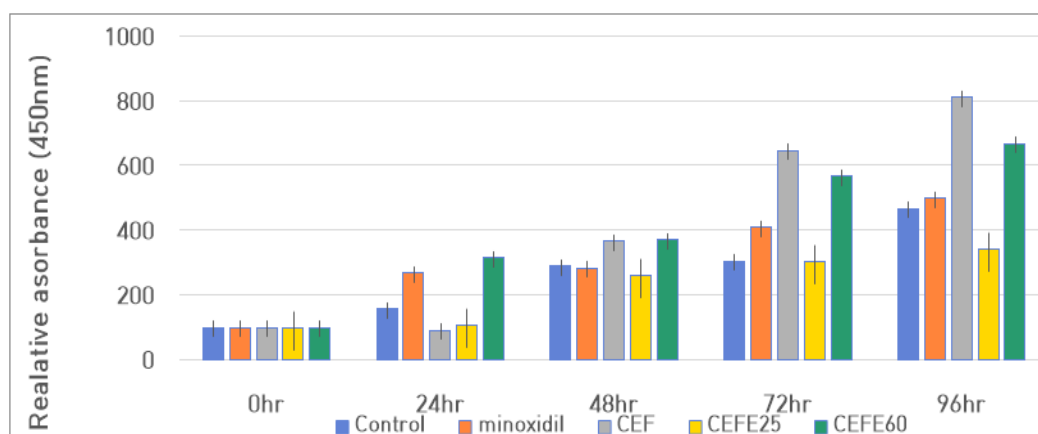
Figure 7. Inhibitory effect of inflammatory cytokine gene expression according to the green coffee bean fermented product treatment.



3.4.5. Dermal papilla cell growth rate

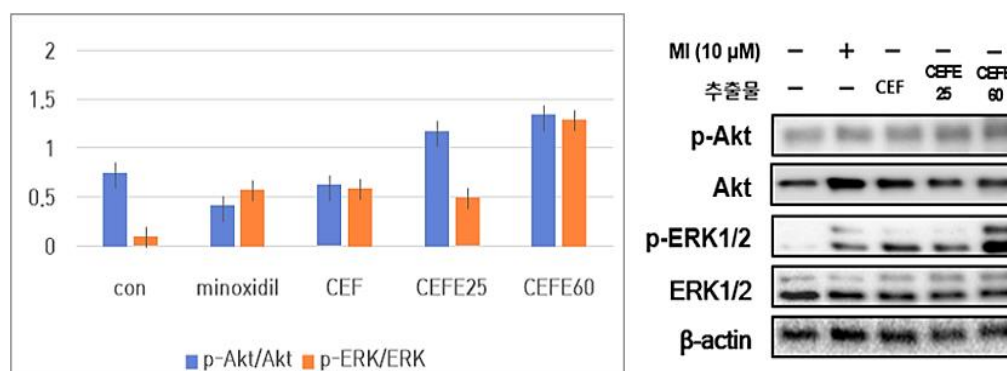
It was sought to verify the cell growth effect on the human body's dermal papilla cells (HHDPCs) by treating the sample. Minoxidil was treated together as the control group, and the effect of the HDP cell growth over time was verified. Consequently, the cell growth effect increased over time in the cells treated with Minoxidil relative to the control, and in the cells treated with the sample, the 25 °C enzyme fermentation of green coffee bean's EM and 60 °C enzyme fermentation of green coffee bean's EM demonstrated a significantly superior cell growth effect than the control group of Minoxidil.<Figure 8>

Figure 8. Growth effect of the human dermal papilla cells (HHDPC) according to the green coffee bean fermented product treatment.



To examine and investigate the signaling pathways related to the growth of dermal papilla cells, the effect on Akt and ERK phosphorylation was verified and the western blot was performed. As a result of the experiment, it decreased for the positive control group of Minoxidil's treatment, relative to the control group, and significantly increased for the group treated with the sample. In particular, the 60 °C enzyme fermentation of green coffee bean's EM demonstrated 10 times more expression of the ERK phosphorylation than control and 2.5 times more than Minoxidil.<Figure 9>

Figure 9. Akt and ERK phosphorylation effect according to the green coffee bean fermented product treatment.



4. Conclusions

In this study, the active ingredients and effectiveness (*in vitro*) were analyzed after the continuous fermentation of green coffee bean as the main material, soluble microorganisms (EM), and malt used in the manufacture of traditional beverages. As a result of the study conducted, the following conclusions were reached.

First, the caffeine and sugar content increased during the EM fermentation and the enzyme fermentation, and there was no differences according to the enzyme fermentation temperature.

Second, the content of the total polyphenols and total flavonoids did not change significantly depending on the presence or absence of fermentation or enzyme fermentation, and hence, it was expected that there would be an activation of antioxidants.

Third, the 60 °C enzyme fermentation of green coffee bean extract's EM fermentation had excellent anti-inflammatory properties.

Fourth, the 60 °C enzyme fermentation of green coffee bean extract's EM fermentation solution demonstrated an excellent rate of dermal papilla cell growth.

As a result of the study, it was verified that the fermented extract of green coffee bean has excellent antioxidant activity, anti-inflammatory activity, and dermal papilla cell growth rate, and hence, it may be expected to promote hair growth, and that the application would be useful as a cosmetic material for the scalp hair which is effective for the health of scalp hair. The difference of this study is that coffee, which is an edible and clinically safe natural material, was used as the main raw material for the 2 phased continuous fermentation by using the EM and malt, and is also environmentally safe by using water as a solvent.

I hope that the search for natural fermented cosmetic materials that can help the health of the scalp and hair continues, and it is thought that human application tests will be necessary in the future after manufacturing scalp and hair care cosmetics containing these fermented products. It is hoped that it will be helpful in maintaining healthy scalp and hair management.

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6. Appendix

6.1. Authors contribution

	Initial name	Contribution
Lead Author	MC	-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"/> -Final approval of the paper <input checked="" type="checkbox"/> -Corresponding <input checked="" type="checkbox"/> -Play a decisive role in modification <input checked="" type="checkbox"/>
Corresponding Author*	EC	-Significant contributions to concepts, designs, practices, analysis and interpretation of data <input checked="" type="checkbox"/> -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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Effect of Group Art Therapy on Learned Helplessness and Self-Leadership

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Abstract

Purpose: Group art therapy is the introduction of art to group psychotherapy, and the client observes how others in similar situations solve their problems through group activities. In addition, through this, they can give and receive help among themselves and form an organic bond. Group art therapy has the characteristic that art activities help promote emotional expression that has been suppressed in the past, and self-exposure and self-understanding are actively presented in the group. group art therapy helps the subject to have a deep insight into his or her inner self to solve problems and build a positive self-image.

As a result of examining the programs related to learned helplessness, efforts on measures to reduce helplessness could be found. By conducting group art therapy on learned helplessness and self-leadership, we tried to change negative perceptions and behaviors and increase positive views through group interactions and successful experiences in the art therapy process to help rational decision-making. As such, the purpose of this study is to provide basic data on a counseling approach that gives a sense of accomplishment and converts negative motivation into positive motivation to reduce learned helplessness and improve self-leadership through group art therapy programs.

Method: Based on the results of the basic research, major variables and related programs related to the learned helplessness and self-leadership of college students were analyzed through various literature and previous research data and reflected in the preliminary program. A preliminary program was conducted to secure empirical evidence for the revision and improvement of the group art therapy program organized according to the program procedure to understand the acceptance of participants and the effectiveness of the program. It consists of verifying the effectiveness of the group art therapy program for college students. To verify the effectiveness, 10 experimental groups and control groups were formed for students at D University located in Daegu, Gyeongsangbuk-do, and from April to June 2021, it was conducted twice a week for 100 minutes and a total of 10 sessions.

Results: In the experimental group, there was a significant difference in learned helplessness and self-leadership. In the case of learned helplessness sub-factors, it was found that there was a significant effect in sub-factors excluding depression and negative perception. In the sub-factors of self-leadership, significant effects were found after the program.

Conclusion: As discussed in this study, it was found that the group art therapy program is effective in reducing learned helplessness and promoting self-leadership of college students.

[Keywords] Group Art Therapy, Learned Helplessness, Self-Leadership, Group Counseling, Effect

1. Introduction

Art therapy helps humans grow and rehabilitate through practical art activities. Helping clients understand their artistic expressions, and the production process and art activities are also included as art therapy, and art therapy enables self-development, compensation, and change

through this process. The first thing that distinguishes art therapy from other psychotherapy is that it uses non-verbal expressions. Emotions or traumatic memories that are difficult to express in language can be expressed and transmitted as images. In addition, emotions and thoughts that are not organized inside do not need to be expressed logically and grammatically following the rules of language, and conflicting and ambiguous elements can be expressed in a picture. Art's ability to include such contradictory elements helps to integrate the experiences and emotions of conflict[1].

Second, for the client, the visual language of art activity is an unfamiliar method for communication, so one cannot easily hide oneself. As a result, emotions and thoughts that were not expressed without even realizing themselves, including their own unconsciousness, are expressed. In addition, art therapy can express intense emotions through images. And through such a process, one experiences emotional purification. Art therapy has many advantages, but it is noteworthy that it exerts creativity in the treatment process. It can be said that the creativity exerted by the client in the treatment process improves self-growth and self-acceptance of art therapy while being linked to human internal integration[2].

group art therapy introduces art in group psychotherapy, allowing clients to observe how others in similar situations solve their problems through group activities, help each other, and form a natural bond. For clients who have difficulty expressing themselves to others, they communicate through a medium of nonverbal art to form a smooth interpersonal relationship[3]. group art therapy is the use of art activities to promote emotional expression that had been suppressed in the past. This is to express oneself and enhance one's understanding of oneself through art activities within a group. As such, group art therapy helps to solve problems by deep insight into one's inner self and to increase self-esteem by having a positive self-image[4].

The main cause of learned helplessness is the idea that one will not be able to control future results, rather than the current failure experience. Repeated failures of academic achievement in high school extend its experience to universities, resulting in a significant increase in learned helplessness. It has also been seen in various studies that repeated experiences of failure in inherent studies are a factor that causes college students to form learned helplessness. Excessive competition for better educational background and college rankings act as continuous variables for learned helplessness every year[5].

For self-leadership, there are many studies showing that self-directed learning is possible only when one has the ability to control oneself. Personal and environmental backgrounds affect individual learning experiences, and learning experiences affect self-efficacy and outcome expectations. In turn, self-efficacy and outcome expectation arouse interest, interest predicts goals, and goals select activities and lead to performance results. Self-leadership can be said to be a series of processes that motivate and influence oneself to set one's own goals and achieve them. Self-leadership influenced self-control theory, and self-control strategies consist of self-observation, self-goal setting, signal strategy, self-reinforcement, self-punishment, and rehearsal[6]. These strategies were later reborn as the concept of self-management as they were introduced into the organizational settings. The most important factor in the occurrence of learned helplessness is the prediction that one's reaction will not be able to control future outcomes, that is, the thought that the response and outcome will not be related. Self-leadership fostered through self-effort and training is creative and flexible thinking and a leadership element to become a member of modern life[7]. Related previous studies have identified major variables in reducing learned helplessness and promoting self-leadership, and their influence has also been confirmed in recent studies on the direct relationship between learned helplessness and self-leadership. However, in order to reach a more general conclusion on the relationship between learned helplessness and self-leadership, follow-up studies considering sub-variables are needed. Therefore, this study aims to investigate the relationship between learned helplessness and self-leadership, which are emotional, cognitive, and behavioral aspects.

2. Theoretical Background

2.1. Learned helplessness

Learned helplessness is believing that there is no relationship between one's behavior and outcome through repeated experience of failure despite efforts to limit or suppress an action in a negative situation. It is a psychological state in which one loses motivation and causes performance deficits when one perceives that one's response can no longer change any outcome by repeatedly experiencing uncontrollable situations[8]. Common symptoms of learned helplessness include increased passivity, lack of patience, depression, negative cognition, learning deficits, decreased efficient problem-solving skills, decreased aggression, and decreased psychological function. The nature of learned helplessness is first, it directly induces motivation defects and cognitive distortion, second, it causes emotional confusion, third, it can be prevented and treated, and fourth, its condition is very complex and diverse, forming over a long period of time. As such, the causes are complex and diverse. Therefore, it is found that subjects experiencing learned helplessness exhibit more severe depression, anxiety, and hostility than those who were not exposed to these experiences[9].

Each scholar presents various views on why learned helplessness occurs, but there is a limit to comprehensive explanation. However, it seems clear that learned helplessness does not appear as a single symptom, but rather as various characteristics appear simultaneously, and it causes behavioral division in uncontrollable situations, which is a major obstacle to one's growth and development. One of the most important factors in the occurrence of learned helplessness is the formation of a belief that one's response has no effect on the outcome and experiences uncontrollability in negative situations, resulting in decreased self-esteem and simultaneous motivational, cognitive, and emotional deficits. Motivational deficiencies lead to passivity and decreased patience, cognitive deficiencies lead to decreased task performance and problem-solving skills, and emotional deficiencies accompany depression and anxiety[10]. In addition, low self-esteem, low expectations for success, poor individual decision-making ability, sense of inferiority, anxiety, depression, guilt, and lack of persistence are the causes of helplessness.

It can be seen that the learned helplessness above is an important factor that can cause motivational, cognitive, and emotional disorders[11]. First, in terms of behavior, motivation is decreased. They think that any action will have no effect on the outcome due to repeated failure experiences, so they miss the timing of the action because they have low motivation for the reaction and cannot determine where to act. Second, in terms of cognition, it is learned that there is no relationship between reaction and result, so it is recognized that effort and result are irrelevant. For this reason, it does not show the willingness to try because it is unsure even in situations where it can succeed. It does not even show the willingness to do what can be done with one's own ability. Third, in terms of emotion, one becomes insensitive to the feelings of oneself and others, and one falls into a state of depression. As a result, it causes emotional confusion and can lead to maladjustment to school life[12]. A person with learned helplessness lacks a connection between reaction behavior and outcome, so the perception that one's reaction cannot control the outcome is formed and becomes helpless. To overcome this, it is necessary to create an environment that recognizes the accompanying nature between reactions and results. In terms of behavior, the decline in motivation is the most important factor in behavioral change. Motivation is an internal state in which a certain action is initiated and is continued to achieve a goal. Motivation is not a simple hope or desire, but an expression of strong will. In other words, motivation can be said to be an important force in determining an individual's level or degree of behavior. In terms of emotion, learning helplessness makes one insensitive not only to one's own feelings but also to others' feelings, invokes negative emotions such as depression, anxiety, and guilt, and leads to self-deprecation, aggression, passivity, and school maladjustment[9]. Therefore, in order to overcome learned helplessness, it is necessary to inspire confidence behaviorally, emotionally, and cognitively, and to help them have a positive and active lifestyle.

2.2. Self-leadership

Leadership has evolved along with human history and is showing changes in the world today. Looking at the development process of leadership, in the past, it was only a concern of a small number of leaders, but now self-leadership, which controls and leads itself, is recognized as an important factor. Leaders are nurtured through learning, not born, and should enable everyone to have self-leadership through learning[13]. Scholars who emphasized adult learners' self-leadership said that using cognitive and hyper-cognitive strategies, they motivate themselves and exert positive influence to achieve and satisfy goals through self-control. It is also a new paradigm of leadership that motivates and exerts influence on one's own growth and development by conceptualizing the actions and thinking strategies taken by individuals to exert influence on oneself. Another theory that influenced self-leadership is the theory of intrinsic synchronization. This is an extended concept that focuses on natural rewards such as outcomes obtained through self-directed activities[14]. The conceptualization of natural rewards based on intrinsic motivation also suggests the need for self-determination and competence, which is the main way to lead intrinsic motivation. As described above, in order to overcome one's internal and external environment, achieve one's own goals, derive positive results, and lead a better life by cultivating a sense of accomplishment and self-efficacy, it can be seen as a series of overall processes of self-motivation.

The components of self-leadership are described as strategies. Specifically, cognitive and behavioral strategies refer to means to promote self-leadership, and there are three main strategies covered[15]. The first is an action strategy that focuses on effective behavior, the second is an internal compensation strategy that is a highly motivational factor for achievement through work, and finally, a thinking strategy that emphasizes the management of individual positive thinking patterns. College students are required to move away from a passive and dependent lifestyle and switch to a self-responsible, independent, and active lifestyle, but lack the ability or quality to adequately cope with the new environment, making it difficult to switch to an active lifestyle[16]. College students have difficulty planning and preparing for autonomy, responsibility, and career paths because they do not properly form values, self-identity, and self-goals about what to learn in college and what to do in the future. Therefore, in order to grow into a responsible and mature person, leadership developed during college students as an independent subject plays the role of a compass necessary to plan and lead future life.

2.3. Prior research on learned helplessness and self-leadership group art therapy

Programs that have a significant effect on reducing learned helplessness include group counseling and self-efficacy programs, "heart-caring" art therapy programs, practical meditation, and yoga group training programs through learned helplessness overcoming programs. Group art therapy can be performed to change negative perceptions and behaviors through group interactions and successful experiences in the art therapy process. In addition, there is a previous study that group art therapy was effective in reducing the learned helplessness of high school female students and reduced the learned helplessness of adolescents. In addition, group art therapy was effective in reducing the learned helplessness and depression emotions of the elderly. Looking at this, it can be seen that art therapy had a positive effect on reducing learned helplessness. When looking at the characteristics and psychological characteristics of learned helplessness, learned helplessness influenced individual depression, and there is a study result that this depression is related to career path. Seligman (1979) said as follows. First, learned helplessness directly induces motivational deficits and cognitive distortion. Second, learned helplessness causes emotional confusion. Third, learned helplessness can be cured. Fourth, learned helplessness can be prevented. Fifth, learned helplessness has limitations and conditions. Seligman (1975) stated that the most typical symptom of learned helplessness was decreased motivation. Among them, the most characteristic reaction is the decline in starting behavior, and when the subject is placed in an uncontrollable state, it becomes passive, passive,

negative, and egocentric. It often appears in adolescents due to repeated failure experiences. The characteristics of learned helplessness are divided into seven factors to view the group program[17].

It can be seen that self-leadership programs are effective not only for children but also for elementary, middle, high school, college students, and adults. Looking at the effects based on previous studies, the self-leadership program improves self-esteem and has a positive effect on self-efficacy and leadership improvement. Research results mention the necessity, importance, and effectiveness of self-leadership education to foster the ability and skills to lead one's life independently[18].

In addition, a study on the effect of self-leadership on adolescents' studies reveals that adolescents' self-leadership affects career preparation behavior. For example, as a result of applying self-leadership programs to adolescents with cerebral palsy to find out the effect of self-identity and self-directed learning ability, the self-leadership program was found to be an important factor in predicting the level of career motivation[19].

As confirmed in the above study, self-leadership influenced self-esteem, self-efficacy, leadership skills improvement, social maturity, and behavior control ability regardless of the target, resulting in positive results not only in self-understanding but also in interpersonal relationships [20]. However, as a result of analyzing these preceding studies, the following limitations were found as well.

First, various studies on different variables are needed as studies on improving leadership skills, self-esteem, and efficacy are mainly focused on the impact of infants, adolescents, college students, and adults through existing self-leadership training programs. Second, many studies related to self-leadership are limited to self-leadership training programs, so studies on the effectiveness of direct training are insufficient. Third, self-leadership training proves many effects regardless of targets such as infants, elementary, middle, high school, office workers, and adults. Nevertheless, self-leadership training programs that will help them make career decisions have not been applied to college students who belong to the decisive period of leadership formation [21]. Fourth, self-leadership training education is mainly limited to short-term education, mainly focusing on changes in beliefs and attitudes. Therefore, helpless behavioral changes have not been measured, and it is difficult to confirm the persistence in terms of their effectiveness.

Complementing these points, this study attempted the following. First, considering that leadership education is difficult to confirm the continuity of the effect in a short period of one to two days, it was conducted twice a week, for 5 weeks, and it was intended to check not only changes in beliefs and attitudes but also actual behavior until the 20 days after the program was terminated. Second, it was approached in the form of small group counseling so that cognitive, emotional, and social balance could be achieved. Third, we tried to examine the effects of various variables on the cultivation of leadership skills and self-efficacy through training to reduce learned helplessness and promote self-leadership[22].

3. Composition of Programs to Reduce Learned Helplessness and Promote Self-leadership

3.1. Cognitive aspect

If one falls into helplessness, first, in cognitive terms, learning that there is nothing to do with reaction and outcome is irrelevant, indicating no willingness to try because one is unsure even in situations where one can actually succeed. In other words, since there is a lack of a connection between the reaction behavior and the result, the perception that one's reaction cannot control the result is formed, making one helpless[23]. Therefore, it is necessary to create an environment

that recognizes the accompanying nature between reactions and results. Second, internal control is greatly influenced by self-control. When having low internal control, successful results tend to be considered as external factors rather than one's own ability, while failure tends to be considered as one's own lack. Lack of control over oneself causes helplessness, and if such helplessness is repeated, it is no longer challenging. Therefore, in order to reduce learned helplessness, the focus should be on increasing internal control by enlightening the method and responsibility of choosing efficient behavior[24]. In addition, social support provided from the external environment increases adolescents' motivation for achievement and has a positive effect on academic achievement. Those who are highly receptive to themselves and others are likely to learn successfully[25]. Therefore, natural reward strategies, a sub-component of self-leadership, are strategies that emphasize the interesting aspects of tasks given and motivate and reward individuals themselves. Natural compensation behavior is effective in promoting confidence, self-control, strengthening motivation, and improving work achievement. To establish a constructive thinking strategy, establish constructive and effective habits or patterns in one's thinking (e.g., pursue positive thinking, not negative thinking). Conversation with oneself gives one confidence that one can perform better on what one has to do, so that positive results come out. Beliefs are a way of self-leadership thinking strategies that correct distorted thinking (extreme thinking, excessive generalization, etc.), and imaginary experiences are always a way of intentionally imagining positive results before initiating an action[26].

Therefore, it is possible to design goals in the program, make continuous efforts to achieve them, flexibly solve problems, difficulties, and conflicts in the college life process, and inspire willingness to achieve the goals. To this end, specific activities focus on success and continuously engage in goal-oriented behavior, especially when there are obstacles in the process of performing stress and academic goals, to flexibly solve problems and adapt to successful academic achievement and college life[27].

3.2. Behavioral aspect

In order to overcome learned helplessness, it is necessary to help them have a behaviorally positive and active lifestyle. In addition, it is necessary to increase the control to control the degree of emotion and effort, persistence to concentrate on work, positive expression of oneself, and responsibility. Self-leadership's behavior-oriented strategies are to motivate and perform positive and desirable actions that lead to successful results, while controlling negative and undesirable actions that lead to unsuccessful results[28]. The protagonist of one's life is to think of oneself as the main character, that is, to find one's identity and to think and act on one's own first. It allows students to have positive expectations, focus on success, continue to take goal-oriented actions, and flexibly solve problems when there are obstacles in the performance process so that they can adapt to successful academic achievement and college life. Therefore, through art activities, you express unconscious wishes or conflicts as well as your conscious thoughts and emotions, and gain a sense of accomplishment and control through emotions, thoughts, and conflicts that you are not aware of[29].

3.3. Emotional aspect

It was said that the social support provided from the external environment was effective in reducing the negative emotions, depression, and delinquency of adolescents. In his book, Seligman (2012) stated that pleasant life is a life that constantly pursues positive emotions in the present, past, and future, including activities to promote optimism and hope to improve positive emotions about the past. Therefore, through art activities, one tries to express one's feelings as well as unconscious wishes or conflicts, feel the value of one's existence for emotions one was not aware of, and discover the meaning of life[30].

4. Conclusion

4.1. Subject of study

Group art therapy was conducted by assigning 10 people to the experimental group and 10 people to the control group through wireless sampling for 20 applicants.

4.2. Research design

This study was to verify the effectiveness of the group art therapy program and the subjects were expressed in a randomized allocation method in the population and randomly assigned to the experimental group and control group.

Table 1. Research design.

Group	Pre-examination	Experimental treatment	Post-examination	Later inspection
EG(R)	O ₁	X	O ₃	O ₅
CG(R)	O ₂		O ₄	O ₆

Note: EG: experimental group, CG: control group, R: randomization, X: treatment, O₁/O₂: pre-examination, O₃/O₄: post-examination, O₅/O₆: later inspection, X: experimental treatment.

4.3. The effects of group art therapy programs on learned helplessness

<Table 2> shows the results of repeated measurement variance analysis to see if there is a difference between the group and test period.

Table 2. Learned lethargy repeated measurement variance analysis.

A variable	Dispersion circle	Sum of squares	Free-degree	Mean square sum	F
Total . learned lethargy	Subject-to-subject				
	Group	8880.400	1	8880.400	129.065***
	Error	1238.500	18	68.806	
	In the subject				
	Inspection time	9120.400		9120.40	532.147***
	Group × Inspection time	9060.100	1	9060.100	528.628***
	Error	308.500	18	17.139	
Depression, Negative perception	Subject-to-subject				
	Group	48.400	1	48.400	.825
	Error	1055.700	18	58.650	
	In the subject				
	Inspection time	547.500		547.500	17.944***
	Group × Inspection time	44.100	1	44.100	1.445
	Error	549.300	18	30.517	
Lack of self-confident	Subject-to-subject				
	Group	1060.900	1	1060.900	179.139***
	Error	106.600	18	5.922	
	In the subject				
	Inspection time	608.400		608.400	63.967***
	Group × Inspection time	960.400	1	960.400	100.977***
	Error	71.200	18	9.511	

Lack of control	Subject-to-subject Group Error	921.600 165.500	1 18	921.600 9.194	100.234***
Passivity	Subject-to-subject Group Error	632.025 57.850	1 18	632.025 3.214	196.654***
	In the subject Inspection time Group × Inspection time Error	525.625 616.225 8.650	1 18	525.625 616.225 .481	1093.786*** 1282.318***
Lack of sociability	Subject-to-subject Group Error	275.625 61.850	1 18	275.625 3.436	80.214***
	In the subject Inspection time Group × Inspection time Error	18.225 50.625 10.650	1 18	18.225 50.625 .592	30.803*** 85.563***
Lack of show-off	Subject-to-subject Group Error	819.025 84.250	1 18	819.025 4.681	174.985***
	In the subject Inspection time Group × Inspection time Error	297.025 354.022 20.450	1 18	297.025 354.022 1.136	261.440*** 311.611***

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

4.4. The effects of group art therapy programs on self- leadership

<Table 3> shows the results of repeated measurement variance analysis to see if there is a difference between the group and test period.

Table 3. Self- leadership repeated measurement variance analysis.

A variable	Dispersion circle	Sum of squares	Free-degree	Mean square sum	F
Total Self-leadership	Subject-to-subject Group Error	7371.225 1368.050	1 18	7371.225 76.003	96.986***
	In the subject Inspection time Group × Inspection time Error	5640.625 5688.225 678.650	1 18	5640.625 5688.225 37.703	149.608*** 150.870***
Action-oriented strategy	Subject-to-subject Group Error	1670.603 2450.514	1 15	1670.603 163.368	40.226**
	In the subject Inspection time Group × Inspection time Error	5739.671 1523.200 2035.800	1 15	5739.671 1523.200 135.700	42.291*** 11.223**

Natural compensation strategy	Subject-to-subject Group Error	72.015 579.514	1 15	72.015 38.634	1.864
	In the subject Inspection time Group × Inspection time Error	408.486 86.603 55.514	1 15	408.486 86.603 3.701	110.373*** 23.400***
Constructive thinking strategy	Subject-to-subject Group Error	645.009 1658.050	1 15	645.009 110.537	5.835*
	In the subject Inspection time Group × Inspection time Error	4014.404 787.463 745.479	1 15	4014.404 787.463 49.699	80.775*** 15.845***

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

As a result of verifying the effect of the group art therapy program on the learned helplessness of college students, it was found that there were statistical differences between groups in the post-test. As a result of post-verification to find out more about the differences between groups, the experimental group that conducted the group art therapy program had a statistically significant difference in the learned helplessness score than the control group[3]. In addition, there were statistically significant differences in the scores of passivity, lack of control, lack of show-off desire, lack of confidence, and lack of persistence among the sub-variables of helplessness learned than the control group[4]. The results of this study showed that group art therapy programs are effective in reducing learned helplessness. These results show that when a group art therapy program is conducted for college students with high learned helplessness, it may be appropriate not only to change their thinking but also to express emotions that are difficult to express in language or to elicit direct behavior by expressing trauma memories in images. College students who participate in the group can experience pleasure through various art activities, actively participate without rejection, and practice controlling not only their emotions but also their actions naturally through the medium of art. In addition, the experience of success through art activities helps you have confidence and experience the desire to show off to others. Summarizing the above results, it can be said that the group art therapy program to reduce the learned helplessness of college students is effective in reducing the learned helplessness of college students[5][7].

As a result of verifying the effect of group art therapy programs on college students' self-leadership, it was found that there were statistical differences between groups in post-tests. As a result of post-verification to find out the difference between groups, the experimental group that conducted group art therapy programs both post-tests had statistically significant differences in self-leadership scores than the control group. In addition, the experimental group that conducted the group art therapy program had statistically significant differences in behavior-oriented strategies, natural compensation strategies, and constructive thinking strategies scores, which are sub-variables of self-leadership than the control group. The results of this study showed that group art therapy is effective in promoting self-leadership. These results show positive results that affect self-esteem, self-efficacy, leadership skills improvement, social maturity, and behavior control ability when conducting programs for college students with low self-leadership, and change not only in self-understanding but also in interpersonal relationships. In addition, the medium of art serves as a medium for not only one's emotions but also relationship exploration and self-achievement. In the process of exploring the surroundings, art activities try something and gain a sense of accomplishment and control through the process. As a result, it

can be said that self-leadership cognitively reconstructs situations or tasks given to it and leads life and learning through behavioral strategies by effectively managing and changing one's type of thinking[17][18]. Taken together, the above results show that the group art therapy program for promoting self-leadership of college students is effective in promoting self-leadership of college students.

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6. Appendix

6.1. Authors contribution

	Initial name	Contribution
Lead Author	CK	-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"/>
		-Final approval of the paper <input checked="" type="checkbox"/>
Corresponding Author*	HC	-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"/>
		-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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The Effect of Adult Women's Lifestyle on the Use of the Beauty Information on Social Media and Skin Care Related Purchase Motivation for the Skin Health Protection

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Abstract

Purpose: Personal hygiene become important due to the Covid-19 outbreak after 2019. An interest in skin health care has received attention to protect facial skin from wearing a protective mask on every day basis. This study has researched on an effect of lifestyle of female adult on searching beauty information through social network service (social media) and motivation to invest on skincare service.

Method: Survey method was used to gather information from 20s~50s of female. The survey consists of life-style, a usage of beauty information through social media, the motivation to purchase skincare service, and demographic variables. To characterize subjects, percentage, average, and frequency were calculated. Pearson Correlation has been applied to analyze the relationship between lifestyle, the usage of beauty information through social media and the motivation to purchase skincare service. Multiple regression analysis was performed to find cause-and-effect relationship.

Results: First, achievement seeking types and trend seeking types were outcomes as lifestyle. Information spread, sharing latest information, a use of information was obtained as a result of use of beauty information through social media. Aims of purchase of skincare were for relaxing, improving skin condition, and external stimulation based on this study. Second, among the lifestyles, achievement seeking types were found to use the latest variety of social media beauty information for purpose of rests, and trend seeking types were found to be active in using various skin care related purchase motivations and social media beauty information.

Conclusion: These studies confirmed that depending on types of lifestyles, an influence of use of beauty information on social media is different on skin care related purchase motivation. This study can be a baseline for marketing in the skin care industry by identifying lifestyle characteristics and use of beauty information on social media characteristics.

[Keywords] Skin Health, Protection, Lifestyle, Social Media, Purchase Motivation

1. Introduction

The excellent speed of the development of modern society has caused many changes to the people's lives, and the desire to pursue the work and life balance has further grown. This has also led to the time and material consumption according to one's own lifestyle, and the leisure time is spent for carrying out various activities.

People have steeply increased the use of social media as the spread of smartphones has expanded[1], and through social media, the information related to leisure activities and hobbies as well as the information related to various contents have been shared with each other, thereby providing a new forum for communication[2][3]. Furthermore, based on the user reviews on

social media, it is easy to access the information about products and services, and the users can easily access useful information[4][5].

As for the beauty industry, based on the advantages of social media, there is a trend for actively using social media for promotion and customer attraction to increase profits[6][7]. In particular, given the specialization and diversification of consumer needs and expectations[8][9], strategies such as emotional marketing for the customer satisfaction and customer inspiration and experiential marketing to improve the service quality have been used[10][11].

COVID-19, which began in 2019, spread around the globe in 2020, compelling social distancing and restricting face-to-face meetings, and creating new social rules centered on online face-to-face[12][13][14][15], whereby cultural life and surrounding environments have changed[16], which has brought about changes in the lifestyles of the modern people.

According to the Korea Press Foundation's survey on the changes in people's daily life since COVID-19, there has been a significant change in smartphone, TV, and PC usage as outside activities decreased and home activities such as the use of media and online shopping increased significantly, among which the use of phones has most increased. Furthermore, personal hygiene and health care for the prevention of COVID-19 related droplet infection, and skin problems caused by the prolonged wearing of masks, activities such as skin health care and appearance management have increased as well[17][18].

The skin health management aims to prevent skin troubles by optimizing the skin's natural functions including immune function, protection function, physiological function, secretion and absorption function, and control function, and also maintain healthy skin with radiance and elasticity[19], and following COVID-19, people changed their skin health from using large scaled, multi-purpose facilities such as sauna and hot springs to the preferred use of personalized services such as skin care shops and nail salons with as much little contact with people[20].

The skin care shop's service externally aims to maintain, protect, and improve the skin of the face and body by helping to activate the internal physiological functions, and internally, provide stress relief and stability, while providing the customers with skin care and lifestyle habits[21][22][23], and hence, it is thought to be of great help for the skin care and health care.

In the aftermath of COVID-19, functions such as health, immunity, and hygiene will be added, or beauty products using natural ingredients beneficial or health will increase[24][25][26], and the consumers looking for the skin care shop services in terms of health care which combines natural healing therapies are also expected to increase[27][28][29].

Accordingly, the purpose of this study is to examine and understand the effect of the adult women's lifestyle on the use of beauty information on social media and the skin care related purchase motivation. And through this, it is meaningful to identify the lifestyle characteristics of adult women, analyze the influence of use of beauty information on social media on consumers' skin care related purchase motivation, and present the basic marketing data to provide the skin care related purchase information on social media.

2. Research Method and Procedures

2.1. Sample selection and the data collection

This study has distributed and collected questionnaires for women in their 20s to 50s from December 1, 2020 until December 21, 2020. Of the total 420 copies distributed, 413 copies were collected, and 409 copies were used for the final statistical analysis, excluding the 4 copies with

insincere responses. The questionnaires were consisted of lifestyle, use of beauty information on social media, skin care related purchase motivation, and demographic variables, and there were a total number of 43 questions.

Lifestyle turned out to have two factors of achievement seeking type and trend seeking type used in the study of Jung JY & Han JM[30], and as a result of the factor analysis performed, it turned out to be 2 factors of 9 questions, and as for the use of social media beauty information, the 3 factors used in the study of was Lee CH & Kim KH[31] were information diffusion, latest sharing, and useful information, and hence, they turned out to be 3 factors of 10 questions as a result of the factor analysis performed. As for the skin care related purchase motivation, there were 3 factors used in the study of Oh SY & Jeon JH & Rhee YS[32], which were the purpose of rest, skin improvement, and external stimulation, and as a result of the factor analysis performed, 3 factors of 11 questions were used for the final analysis, while a 5 point Likert scale was used.

For the data analysis of this study, the SPSS WIN 25.0 program was used.

To examine and understand the demographic characteristics of the study subjects, the frequency, percentage, and average were calculated. To examine the relationship between lifestyle, use of beauty information on social media, and skin care related purchase motivation, the Pearson's moment correlation was calculated. The significance level of all analyzes is $\alpha=.05$, respectively.

2.2. Research questions

The purpose of this study is to examine and understand the effect of the adult women's lifestyle on the use of beauty information on social media and the skin care related purchase motivation. Specific research questions for this purpose are as follows.

Research question #1. Examine and understand the general characteristics.

Research question #2. Examine and understand the factor analysis and reliability analysis of the adult women's lifestyle, use of beauty information on social media, and skin care related purchase motivation.

Research question #3. Examine and understand the correlation between the adult women's lifestyle, use of beauty information on social media, and the skin care related purchase motivation.

Research question #4. Examine and understand the effect of the adult women's lifestyle on the use of beauty information on social media and the skin care related purchase motivation.

3. Research Results

3.1. General characteristics of the survey subjects

The results of the frequency analysis performed to examine and understand the frequency and percentage of the general characteristics of the adult women in their 20s and 50s, who were the subjects of the study, are as follows. First, examining the age of the 409 people, those in their 30s accounted for the most at 35.2%, followed by those in their 20s (29.3%), those in their 40s (17.8%), and those in their 50s (17.7%), respectively. Examining the marital status, unmarried and married respondents demonstrated similar rates of response at 48.2% and 48.9%, each respectively, and the percentage of those who responded "other" turned out to be very low at 2.9%, respectively. In terms of the final educational background, those with college or university diploma accounted for the most at 46.2%, followed by high school diploma or less at

24.0%, community college diploma at 19.6%, and graduate school diploma or higher at 10.2%, respectively. In terms of occupation, service and sales jobs (self-employed) turned out to have the highest distribution at 24.2%, followed by office workers (public servants) at 18.8%, professional workers at 15.6%, others at 14.3%, housewives at 13.4%, students at 12.7%, production management and technical positions at 1 % were examined, respectively. In terms of monthly income, KRW 2 million or more to less than KRW 3 million accounted for 27.9%, followed by less than KRW 1 million at 19.8%, KRW 1 million to KRW 2 million at 18.6%, KRW 3 million to KRW 4 million at 17.1%, KRW 4 million or more at 16.6 %, respectively. In terms of monthly care for looks related expenses, less than KRW 100,000 accounted for 40.6%, followed by KRW 100,000 to less than KRW 200,000 at 30.1%, KRW 200,000 to less than KRW 300,000 at 14.7%, KRW 300,000 to less than KRW 400,000 at 8.8%, and KRW 400,000 or more at 5.8%, respectively.

3.2. Validation of the validity and reliability of measurement tools

The factor analysis was performed to validate the validity of the questions used for this study and found common factors and used them as variables. In this study, the principal component method was used as the factor extraction method, and only the factors with eigenvalues greater than or equal to 1.0 were extracted. Verimax rotation was performed in connection with the factor rotation. The factor loading indicating the extent of correlation between the factors of each variable was analyzed based on 0.5 or more.

Furthermore, in this study, the Cronbach's α was calculated to verify the internal agreement between the questions to validate the reliability of the questions measured on the multi-question scale with homogeneous questions.

Table 1. Lifestyle factor analysis and reliability analysis for adult women.

Question	Lifestyle		Commonality
	Achievement seeking type	Trend seeking type	
I think I have a lot of personal skills.	.830	.051	.691
I can confidently carry out a given task.	.793	.065	.633
I'm more confident than most others.	.786	.162	.644
When I set my mind to doing something, I always get it done.	.703	.265	.564
I have a desire to achieve something.	.683	.347	.587
I tend to fast adapt to new fashions and trends.	.138	.837	.719
I'm very interested in my looks and beauty.	.175	.833	.724
I pay attention to what the people around me are wearing.	.095	.813	.670
I think that dressing well is an attitude of having respect for myself.	.241	.731	.593
Eigenvalue	3.011	2.814	
Dispersion (%)	33.453	31.267	
Cumulative (%)	33.453	64.720	
Reliability (Cronbach's α)	.839	.841	
Overall reliability	.846		
Validation of KMO and Bartlett	KMO=.850, $\chi^2=1,537.691$ $p<.000$		

Table 2. Factor analysis and reliability analysis for the use of beauty information on social media.

Question	Use of beauty information on social media			Commonality
	Information diffusion	Latest sharing	Useful information	
I saw beauty information on social media and recommended it to an acquaintance of mine.	.813	.180	.242	.751
I comment or share beauty information on social media.	.744	.091	.299	.651
The beauty information provided on social media aligns with my interests.	.611	.493	.263	.686
I saw beauty information on social media and bought or followed the product myself.	.599	.476	.179	.617
Beauty information on social media I use is shared by many people.	.574	.410	.169	.526
The latest beauty information is provided on social media.	.122	.842	.241	.782
Beauty information is continuously provided on social media.	.337	.820	.071	.791
Beauty information on social media is generally reliable.	.257	.035	.879	.840
Beauty information provided on social media is useful.	.270	.392	.759	.803
Beauty information provided on social media is helpful for me.	.352	.338	.553	.724
Eigenvalue	2.848	2.329	1.994	
Dispersion (%)	28.483	23.287	19.940	
Cumulative (%)	28.483	51.770	71.710	
Reliability (Cronbach's α)	.845	.764	.825	
Overall reliability	.903			
Validation of KMO and Bartlett	KMO=.902, $\chi^2=2,098.243$ $p<.000$			

Table 3. Factor analysis and reliability analysis for the skin care related purchase motivation.

Question	Skin care related purchase motivation			Commonality
	Purpose of rest	Skin improvement	External stimuli	
For rest	.824	.167	.075	.712
For health	.820	.108	.115	.698
For a change of mood	.757	.109	.132	.602
For body shape care	.735	.244	.037	.600
When very stressed	.697	.019	.441	.680
When the skin doesn't seem to have elasticity	.166	.819	.066	.702
When the skin looks dry and wrinkled	.065	.799	-.050	.645
When skin looks dull	.135	.698	.246	.566

When my reflection in the mirror looks old	.183	.670	.255	.548
When a popular celebrity introduces skin care methods on TV	.164	.143	.850	.770
When someone else's skin looks beautiful	.141	.175	.823	.728
Eigenvalue	3.079	2.406	1.764	
Dispersion (%)	27.991	21.873	16.039	
Cumulative (%)	27.991	49.864	65.902	
Reliability (Cronbach's α)	.854	.769	.721	
Overall reliability	.841			
Validation of KMO and Bartlett	KMO=.832, $\chi^2=1,668.238$ $p<.000$			

3.3. Correlation among the adult women's lifestyle, the use of beauty information use on social media, and the skin care related purchase motivation

In this study, the causal relationship of each variable of the adult women's lifestyle, use of beauty information on social media, and the skin care related purchase motivation was validated via the correlation analysis performed. The following <Table 4> illustrates the results of the correlation validation to examine and understand the correlation between the variables each individually.

As a result of the analysis performed, it turned that the 'achievement seeking type' variable among the lifestyle characteristics was not statistically significant for the 'useful information' variable during the use of social media beauty information, and the 'skin improvement' variable and the 'external product' variable among the skin care related purchase motivation, the 'stimulus' variable also turned out to be statistically not significant.

All other variables turned out to have statistically significant relationship ($p<.05$), respectively.

Table 4. Correlation analysis.

Classification	Median	Standard deviation	Achievement seeking type	Trend seeking type	Information diffusion	Latest sharing	Useful information	Purpose of rest	Skin improvement	External stimuli
Achievement seeking type	3.66	.625	1							
Trend seeking type	3.58	.789	.408**	1						
Information diffusion	2.87	.832	.183**	.441**	1					
Latest sharing	3.43	.898	.218**	.378**	.644**	1				
Useful information	2.96	.758	.073	.260**	.724**	.523**	1			
Purpose of rest	3.12	.860	.142**	.243**	.369**	.162**	.288**	1		
Skin improvement	3.55	.736	.055	.152**	.237**	.150**	.243**	.367**	1	
External stimuli	3.10	.971	-.013	.214**	.390**	.230**	.325**	.393**	.356**	1

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

3.4. Effect of the adult women's lifestyle on the use of beauty information on social media

<Table 5> illustrates the results of the multiple regression analysis performed to examine and understand the effect of the adult women's lifestyle on the use of social media beauty information.

In terms of the effect of lifestyle on the information diffusion, the trend seeking type ($\beta=.439$, $p<.001$) turned out to have a statistically significant positive (+) effect, and the achievement seeking type ($\beta=.004$, $p>.05$) turned out to be statistically not significant.

As for the effect of lifestyle on the latest sharing, the trend seeking type ($\beta=.347$, $p<.001$) turned out to have a statistically significant positive (+) effect, and the achievement seeking type ($\beta=.077$, $p>.05$) turned out to be statistically not significant.

In terms of the effect of lifestyle on useful information, the trend seeking type ($\beta=.276$, $p<.001$) turned out to have a statistically significant positive (+) effect, and the achievement seeking type ($\beta=-.040$, $p>.05$) turned out to be statistically not significant.

Hence, in terms of the effect of lifestyle on the use of social media beauty information, it turned out that the trend seeking type of lifestyle has had a significant effect on all factors of information diffusion, latest sharing, and useful information. In the study of Cho HS [33], it turned out that the effort type of lifestyle affects the looks, accessibility, recommendation, and effect among the skin care selection attributes, and as a source of knowledge, 'the Internet' showed the highest rate at 44.5%, which is similar to that, in the study of Ju EL [34], respectively.

Table 5. Effect of lifestyle on the use of beauty information on social media.

Dependent variable		Independent variable	B	SE	β	<i>t</i>	<i>sig.</i>
Use of beauty information on social media	Information diffusion	(Constant)	1.186	.238		4.990	.000***
		Achievement seeking type	.006	.065	.004	.090	.929
		Trend seeking type	.463	.052	.439	8.993	.000***
		R=.441 R ² =.194 F=48.879***					
	Latest sharing	(Constant)	1.608	.264		6.092	.000***
		Achievement seeking type	.110	.072	.077	1.524	.128
		Trend seeking type	.395	.057	.347	6.898	.000***
		R=.384 R ² =.148 F=35.048***					
	Useful information	(Constant)	2.182	.233		9.379	.000***
		Achievement seeking type	-.048	.064	-.040	-.753	.452
		Trend seeking type	.265	.050	.276	5.265	.000***
		R=.263 R ² =.069 F=15.022***					

Note: *** $p<.001$.

3.5. Effect of the adult women's lifestyle on the skin care related purchase motivation

<Table 6> illustrates the results of the multiple regression analysis performed to examine and understand the effect of the adult women's lifestyle on skin care related purchase motivation.

In terms of the effect of lifestyle on the purpose of rest, the trend seeking type ($\beta=.221$, $p<.001$) turned out to have a statistically significant positive (+) effect, and the achievement seeking type ($\beta=.052$, $p>.05$) turned out to be statistically not significant.

In terms of the effect of lifestyle on skin improvement, the trend seeking type ($\beta=.156$, $p<.01$)

turned out to have a statistically significant positive (+) effect, which turned out to be similar to that in a study by Kwon WY[35], where women who are interested in beauty and fashion consider attractiveness related changes as the most important factor for their care for looks. The achievement seeking type ($\beta = -.009$, $p > .05$) turned out to be statistically not significant, respectively.

In terms of the effect of lifestyle on the external stimuli, the trend seeking type ($\beta = .262$, $p < .001$) turned out to have a statistically significant positive (+) effect, which was found in the study of MJ Kim[36], where the more they use beauty services to follow trends, emphasize their individuality, and look beautiful to those around them, the more they use advertisements in the mass media. The achievement seeking type ($\beta = -.119$, $p < .05$) turned out to have a statistically significant negative (–) effect.

Given such results, the achievement seeking type turned out to have a negative (–) significant effect on external stimuli, and the remaining factors turned out to be not significant. This is because, in a study of Oh SY[37], the success seeking type which emphasizes goal-oriented aspects such as pride, self-esteem, and social honor, as well as relational aspects such as human relationships, enjoyment of life, and a sense of belonging turned out to be opposite in terms of the significant results as for the skin improvement, external stimulation, rest, problematic skin, and special purposed skin care related purchase motivation factors.

Table 6. Effect of lifestyle on the skin care related purchase motivation.

Dependent variable		Independent variable	B	SE	β	t	sig.
Skin care related purchase motivation	Purpose of rest	(Constant)	1.996	.265		7.523	.000***
		Achievement seeking type	.072	.073	.052	.992	.322
		Trend seeking type	.241	.057	.221	4.197	.000***
		R=.247 R ² =.061 F=13.181***					
	Skin improvement	(Constant)	3.067	.231		13.261	.000***
		Achievement seeking type	-.010	.063	-.009	-.163	.870
		Trend seeking type	.145	.050	.156	2.894	.004**
		R=.152 R ² =.023 F=4.805**					
	External stimuli	(Constant)	2.626	.300		8.753	.000***
		Achievement seeking type	-.186	.082	-.119	-2.261	.024*
		Trend seeking type	.323	.065	.262	4.963	.000***
		R=.240 R ² =.057 F=12.352***					

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

3.6. Effect of the adult women's use of beauty information on social media on the skin care related purchase motivation

<Table 7> illustrates the results of the multiple regression analysis performed to examine and understand the effect of the adult women's use of beauty information on social media on skin care related purchase motivation.

In terms of the effect of using the beauty information on social media for the purpose of rest, it turned out that information diffusion ($\beta=.412$, $p<.001$) has had a statistically significant positive (+) effect, and latest sharing ($\beta=-.134$), $p<.05$) turned out to have a statistically significant negative (-) effect. However, it turned out not to be statistically not significant for useful information ($\beta=.060$, $p>.05$), respectively.

The effect of use of beauty information on social media on skin improvement, useful information ($\beta=.153$, $p<.05$) turned out to have a statistically significant positive (+) effect, and information diffusion ($\beta=.139$, $p>.05$) and latest sharing ($\beta=-.019$, $p>.05$) turned out to have no statistical significance.

The effect of use of beauty information on social media on external stimuli, information diffusion ($\beta=.350$, $p<.001$) turned out to have a statistically significant positive (+) effect, and latest sharing ($\beta=-.044$), $p>.05$) and useful information ($\beta=.094$, $p>.05$) turned out to be statistically not significant, respectively.

In terms of the effect of use of beauty information on social media on purchase motivation, external stimulation of purchase motivation for skin care and information diffusion had an effect on the purpose of rest, and useful information has had an effect on skin improvement. Hence, it turned out that the diffused information would be helpful when one seeks to purchase skin care for external stimulation and relaxation, and when one seeks to improve the skin caused by skin problems, one seeks to receive help from useful information. This is apparent in the same context as that in the study of Kim HR[38] where information diffusion has had the greatest effect on the interest in beauty and latest sharing has had the lowest effect.

Table 7. Effect of lifestyle on the skin care related purchase motivation.

Dependent variable		Independent variable	B	SE	β	t	$sig.$
Skin care related purchase motivation	Purpose of rest	(Constant)	2.142	.179		11.953	.000***
		Information diffusion	.425	.077	.412	5.519	.000***
		Latest sharing	-.128	.058	-.134	-2.216	.027*
		Useful information	.068	.076	.060	.893	.372
		R=.384 R ² =.147 F=23.268***					
	Skin improvement	(Constant)	2.814	.160		17.558	.000***
		Information diffusion	.123	.069	.139	1.778	.076
		Latest sharing	-.016	.052	-.019	-.305	.761
		Useful information	.148	.068	.153	2.179	.030*
		R=.259 R ² =.067 F=9.681***					
	External stimuli	(Constant)	1.736	.201		8.630	.000***
		Information diffusion	.409	.087	.350	4.724	.000***
		Latest sharing	-.048	.065	-.044	-.737	.462
		Useful information	.121	.085	.094	1.414	.158
		R=.396 R ² =.157 F=25.086***					

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

4. Conclusion

This study sought to examine and understand lifestyle, use of beauty information on social media, skin care related purchase motivation, and demographic characteristics, and also examine and understand the effect of the adult women's lifestyle on use of beauty information on social media and skin care related purchase motivation, whose results were as follows.

First, in terms of the correlation with the adult women's lifestyle, use of beauty information on social media, and skin care related purchase motivation, it turned out that among the lifestyles, the achievement seeking type uses the latest various social media beauty information for the purpose of rest, and in terms of the trend seeking type, it turned out to be active in the purchase motivation for various skin care and the use of social media beauty information.

Second, in terms of the effect of the adult women's lifestyle and use of beauty information on social media on skin care related purchase motivation, the effect of lifestyle on use of beauty information on social media turned out such that 'trend seeking' of lifestyle turned out to have a positive (+) effect on all factors of 'information diffusion', 'latest sharing', and 'useful information', and it turned out that the more the trend was pursued, the more active they were in using the beauty information on social media.

In terms of the effect of lifestyle on skin care related purchase motivation, it turned out that 'trend seeking type' of lifestyle has had a significant positive (+) effect on all factors of 'purpose of rest', 'skin improvement', and 'external stimulation', and it also turned out that the trend for the COVID-19 period was health care and skin care. Furthermore, the 'achievement seeking type' turned out to have a significant negative (-) effect on the factor of 'external stimulus'.

In terms of the effect of use of beauty information on social media on the skin care related purchase motivation, it turned out that the factor of 'information diffusion' has had a significant positive (+) effect on the 'purpose of rest' among the skin care related purchase motivation, and the factor of 'latest sharing' turned out to have a significant positive effect. turned out to have a significant negative (-) effect. The factor of 'useful information' turned out to have a significant positive (+) effect on 'skin improvement', and the factor of 'information diffusion' turned out to have a significant positive (+) effect on 'external stimulation'.

That is, when someone else's skin looks beautiful or when one purchases a skin care service for the purpose of health and rest following severe stress, when one uses beauty information shared and recommended by many people, and when one seeks to improve because one's skin looks dry and wrinkled, it turned out that reference was made for the reliable and helpful information.

In the current research results, it was able to obtain the information of how the lifestyle of the adult women in their 20s to 50s influences on both of the use of beauty information from social media and purchase motivation for the skin care. This research could be used as data for marketing of the skin care industry and stimulus for purchasing skin care service based on their lifestyle.

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6. Appendix

6.1. Authors contribution

	Initial name	Contribution
Lead Author	MP	-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"/>
		-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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Beauty Plastic Surgery Coordinate Protection System using Face Recognition Program

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Abstract

Purpose: The purpose of this study is to increase the satisfaction of customers who want good physiognomy and appearance by creating a system that allows cosmetic plastic surgery professionals to automatically see the faces on screens such as those of mobile devices.

Method: First, the name of each part of the face as a point on the coordinate plane.

Second, the beauty plastic elements were first defined as math formulas, and criteria for determining beauty plastic images were prepared according to the calculation results of inputting information-protected coordinate values into the math formulas.

Third, a method of outputting beauty plastic judgments when the math formulas in which the coordinates of feature points are input satisfies a given condition was presented.

Results: Since philtrum is an important part of physiognomy and plastic surgery, a method of determining criteria related to philtrum was suggested. In addition, since the jawline shows a person's ability in terms of physiognomy, the ratio of the jawline was defined to present the criteria for an angled jawline.

Conclusion: Experts in the service industry, such as physiognomy and cosmetic surgery, are habitually considering ways to analyze facial shapes and create better images according to customer needs. Since it takes time and effort to learn physiognomy professionally, if you have a tool to analyze physiognomy when you do not have knowledge of physiognomy, you can expect much more efficient results. Based on the effect of this paper, when the face appears on the screen, the customer's personality and image will react immediately, enabling the establishment of a system that suggests the direction of procedures for makeup, plastic surgery, and tattoos.

[Keywords] Physiognomy, Beauty Plastic Surgery, Facial Recognition, Jawline, Philtrum

1. Introduction

Everyone is interested in beauty and physiognomy. Since customers' physiognomy needs can be consulted on the Internet, there are countless physiognomy information service sites that currently exist offline and online[1]. Recently, there are many services that use multimedia devices by establishing databases, but there is no facial analysis technology based on geometric concepts and numerical objectivity yet.

An automatic face avatar generation system capable of automatically generating a face avatar most suitable for a user's face on the Internet[2]. The system acquires face images in real time using screens such as mobile devices, detects and recognizes acquired face images, and classifies face features in detail to create avatars of images reflecting users' faces[3][4].

Accurate detection of facial feature points such as eyes, nose, and mouth is very important in facial recognition, physiognomy, beauty, and facial expression analysis[5]. Methods for face

recognition include statistical-based methods[6], neural network-based methods[7], connection structure methods[8], and hidden Markov models[9].

Thanks to the development of a technology that draws a face input on a screen with an avatar, feature points of the face can be displayed in coordinates. The goal of this paper is to provide information on the user's appearance status and physiognomy by setting these feature points as coordinates and creating and calculating mathematical formulas, protecting personal face coordinate information.

No one says that physiognomy is completely unscientific[10]. The physiognomical analysis is an essential process for makeup, plastic surgery, and tattoo procedures. Professionals who perform those procedures have the instinct to habitually analyze the shape of customers' faces to satisfy their needs. The practitioners who have learned physiognomy will be able to provide better results to their customers, but those who have not will need related tools.

Appearance is a comprehensive concept that includes face and body, and appearance management includes the meaning of taking good care of oneself and respecting others[11][12]. Therefore, in modern society, the concept of appearance management is changing in a broader sense and is being replaced by beauty concepts[13].

The concept of beauty plastic surgery is to manage appearance according to social standards and one's own standards[14]. In order to manage one's appearance, one must first understand one's appearance. When the customer's face is reflected on the screen and the face is displayed on the screen, the positions of eyes, forehead, and ears that constitute the face can be automatically recorded in dozens of coordinates. The length or area between the coordinates is calculated by the formula and automatically analyzed according to the conditions of the equation. This will help with procedures to create a better image by knowing the customer's personality, appearance, and past life and predicting the future.

The relationship between the skin beauty industry and physiognomy is actively progressing, and it is becoming an indispensable part of the standards and principles of plastic surgery[15]. The physiognomic point of view is still exerting one-sided utility value from an academic and practical application point of view. Interest in the skin beauty industry, which combines physiognomy, is increasing[16].

Among the many features that make up the face, this paper will deal with philtrum and jawline. As you get older, your philtrum gets longer. From a physiological point of view, the saying that the philtrum must be long to live long is also an expression of old age from a cosmetic point of view. Women who take care of their appearance pay a lot of attention to skin care and are also interested in how to slow and manage skin aging[17]. As you get older, you are more interested in skin care and are more interested in slowing and managing skin aging[18]. In particular, philtrum reduction surgery has a visual effect of preventing skin aging. Considering hormonal changes and social status changes, middle-aged women are considered important customer groups in the beauty plastic surgery industry, and they are highly interested in philtrum reduction surgery[19][20][21].

Chapter 3 defines the elements of physiognomy and beauty plastic surgery as equations and establishes criteria for determining physiognomical features and plastic surgery according to the calculation results in which coordinates are entered in the equation. Figures were designated to determine the criteria by referring to the opinions of experts. Criteria may vary depending on the characteristics of experts, but eventually, they will converge into common figures.

It is important to increase customer satisfaction for beauty plastic surgery. It is important to understand how beneficiaries of those services receive the services. Service quality can increase

customer preference and emotional bond and provide satisfaction to increase utilization[22][23]. Korea's beauty and personal care market is growing, and in order to provide high-quality beauty-related services, efforts to expand and specialize from the viewpoint of emphasizing the differentiation of the beauty service industry are needed[24][25][26]. Currently, the beauty plastic surgery industry is playing a public role in realizing changes in various consumption markets[27].

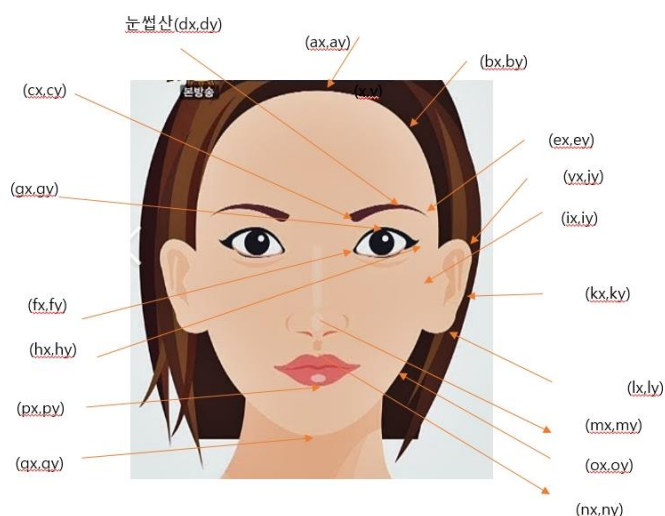
The facial image analysis technology pursued in this paper will be an important part of the beauty plastic surgery industry. This paper focuses on the philtrum, which symbolizes aging, and the jawline, which symbolizes wealth. The next study will gradually expand to eyes, eyebrows, forehead, and ears.

2. Name and Coordinate of Each Point on the Face

2.1. Characteristic points and location of each point.

When there is a rectangular face picture, the lower center (0.0) is set as the point above the coordinate plane, and the upper center of the face is set as (0,100). Name each point characterizing the face and set a coordinate name. If you try to develop an app in the future, you will designate more points.

Figure 1. Characteristic points.



Note: www.bing.com.

Position the feature characteristic points for analyzing physiognomy cosmetic plastic surgery on the face. This face picture is for physiognomy analysis.

2.2. The name and coordinate value of each point

When the face is input to the screen, devices such as scanners are operated to obtain coordinate values of each point. If the face is symmetrical, the process will not be greatly disturbed even if the half is not recorded, so only the right side of each point is designated.

When the coordinates of each point are input and the figures are obtained by the prepared formula, the features of the physiognomy are automatically output depending on whether the figures meet the criteria.

The name and coordinate value of each coordinate of <Figure 1> are shown in <Table 1>.

Table 1. Coordinate names and values

Point	Location	x-coordinate	y-coordinate
A	Top point	0	100.0
B	Above the top of the eyebrow	25.5	89.7
C	Front of the eyebrow	9.5	64.5
D	Top of the eyebrow	25.5	66.7
E	End of the eyebrow	31.3	63.6
F	Front of the eye	10.5	53.4
G	Above the eye	19.4	60.4
H	Corner of the eye	29.8	57.2
I	End of the cheekbone	32.1	45.0
M	Lower ear	37.7	29.5
N	Above the upper lip	0	22.7
O	Center of the jawline	16.5	10.5
P	Below the lower lip	0	13.7
Q	Bottom point	0	0

If the conditions meet by substituting the data of these points into a pre-input formula, the result of the physiognomy is output.

3. The Ratio of Philtrum and Jawline

3.1. Ratio of philtrum

Philtrum is the part between the nose and the upper lip, and from the general physiognomical principle, if one's philtrum is long, one lives long. However, it is difficult to find a numerical reference to the criterion that determines how long is long enough.

In some cases, the concept of an excellent face in terms of physiognomy and in terms of beauty plastic surgery are different. In terms of physiognomy, people with long philtrum live longer, and in terms of plastic surgery, people with short philtrum have a cute impression. In terms of physiognomy, it is said that one is likely to have leadership and wealth when the chin is angled. If there are objective indicators when performing surgery or procedures in the direction customers want with figures for various factors, reliability and stability will be much higher. Recently, research has been conducted on how plastic surgery changes physical satisfaction before and after the surgery. Until now, however, there have been no indicators that meet self-satisfaction by comparing figures on factors of change.

When applying the traditional concept of a long life with a long philtrum, if you assume that the customer's face is long, the length of the philtrum and the entire face can be determined by coordinates. Since each person has a different face size, a physiognomically relative concept will be applied. Even if the philtrum is the same length, some people can see it as long and others can see it as short. Therefore, the concept of long and short is correlated with the total length of the face, so it should be judged as a ratio. In other words, it can be said that all physiognomic criteria are relatively applied as a ratio, not as an absolute number.

Since physiognomy is regarded as a concept that only looks at appearance and estimates without a scientific basis, there is no room for figures to be involved. However, since the philtrum is a very important part not only in terms of physiognomy but also in terms of plastic surgery, we suggest a measurement method of the philtrum and suggest an accurate calculation method. By numerically presenting the criterion that the philtrum occupies is long and short, it is intended to be a measure of judgment in performing surgery or makeup.

3.1.1. Where to measure philtrum

The point at which the philtrum is measured should have an accurate definition. The starting point of the philtrum is under the nose. However, it is debatable to determine where the end-point of the philtrum is near the upper lip. In this paper, the endpoint of the philtrum is the middle point of the upper lip where the philtrum ends.

3.1.2. Ratio of philtrum

The philtrum ratio in this paper was set as the value obtained by dividing the length from the tip of the nose to the top lip of the upper lip by the total length of the face.

[Definition] Total ration of philtrum = $(my - ny) / (ay - qy)$

It is the norm in the modern plastic surgery perspective that a shorter philtrum makes you look younger. Philtrum plastic surgery feels somewhat unfamiliar compared to eye or nose plastic surgery, but it is drawing attention as it is known that philtrum plastic surgery alone can have the same effect as orthognathic surgery and can make one look younger. Recently, a new method of making a definite philtrum is being developed[23].

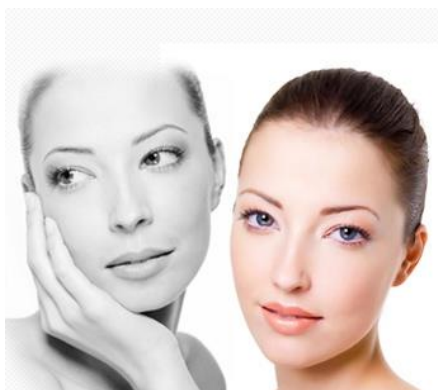
3.1.3. Jaw/philtrum ratio

The total philtrum length can be set to be compared with the total face length, and a method of comparing the philtrum length to the chin-length can also be set. When the length of the jaw is the length of the low point of the lower lip: P (px, py) and the bottom point: Q (qx, qy), the jaw/philtrum ratio is defined as follows.

[Definition] Jaw/philtrum ratio = $(my - ny) / (py - qy)$

Total philtrum ratio = $(my - ny) / (ay - qy)$

Figure 2. Before and after philtrum surgery (golden view cosmetic surgery).



The philtrum ratio before and after surgery of the same person performed at a plastic surgery clinic <Figure 2> is calculated as follows.

Total philtrum ratio before surgery = 0.11

Total philtrum ratio after surgery = 0.06

Jaw/philtrum ratio before surgery = 1

Jaw/philtrum ratio after surgery = 0.5

The criterion in terms of plastic surgery can be seen from this result is that when the total philtrum ratio approaches 1/10 or the jaw/philtrum ratio approaches 1, a surgery is recommended with the recognition that the philtrum is long enough.

It is up to the person to decide which ratio to use in terms of physiognomy, plastic surgery, and tattoo procedures, but we want to open the possibility of using various methods as much as possible.

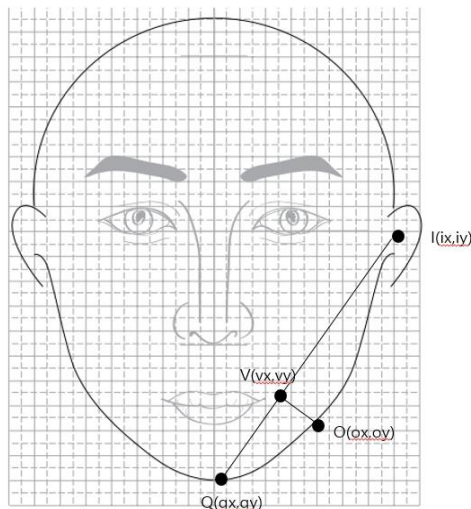
3.2. Jawline ratio

In terms of physiognomy, the jaw is the part of the face with the most changes, and it is a place where you can get a glimpse of the person's willpower. If the forehead implies a person's youth, the jaw is in a state of changing with age.

Based on the physiognomic principle that the shape of the jaw is related to one's luck with wealth, the jawline is quantified to analyze the correlation between the person's personality and luck with wealth.

To analyze the shape of the jawline, the face shape is calculated on the grid as follows[10].

Figure 3. Calculation of the jawline



When the line connecting the cheekbone endpoint $I(ix, iy)$ and the lower point of the jaw center $Q(qx, qy)$ is \overline{IQ} and the median of ix and qx is ox , the point where the line $x=ix$ and the jawline intersect is point $O(ox, oy)$.

The farther the point $O(ox, oy)$ is from the straight line \overline{IQ} , the more angular the face will look, and the closer it is, the sharper it will look.

From a physiognomic point of view, it is known that a person with an angled jaw is diligent, masculine, overcomes difficulties well, and is sociable. On the other hand, a person with a pointed jaw has a delicate and neat personality but doesn't care about others and is prone to fail in business[28].

A point where a line drawn at a point $O(ox, oy)$ perpendicular to line \overline{IQ} is $V(vx, vy)$. The linear distance between point $O(ox, oy)$ and the point $V(vx, vy)$ is the shortest distance between point $O(ox, oy)$ and line \overline{IQ} . The process of finding a point $V(vx, vy)$ is a mathematical problem.

The distance between a point and a line is the distance when the straight line drawn at a point meets line $\overline{I\bar{Q}}$ vertically[29].

Distance between point O(ox, oy) and V(vx, vy): $\sqrt{(ox - vx)^2 + (oy - vy)^2}$.

Distance between point I(ix, iy) and Q(qx, qy): $\sqrt{(ix - qx)^2 + (iy - qy)^2}$.

The ratio of the length of the two lines is the jawline ratio.

[Definition]

$$\text{Jawline ratio} = \frac{\sqrt{(ox - vx)^2 + (oy - vy)^2}}{\sqrt{(ix - qx)^2 + (iy - qy)^2}}$$

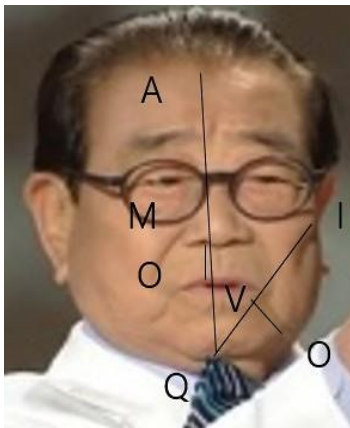
Since the jaw ratio is defined, the calculated figure comes out immediately when the formula is entered and the points are substituted. The criterion that the jawline ratio is angled jaw if it is more than a certain figure, and the pointed jaw if it is less than a certain figure, can be calculated by collecting opinions from physiognomical experts and designating an average value.

Looking at the Song-Hae, Korea's representative long-lived MC Comedian. his jawline ratio is calculated to be about 28.4%

$$\text{Song-Hae's Jawline ratio} = \frac{\sqrt{(ox - vx)^2 + (oy - vy)^2}}{\sqrt{(ix - qx)^2 + (iy - qy)^2}} = \frac{\sqrt{(11.5)^2 + (11.5)^2}}{\sqrt{(44.2)^2 + (36.5)^2}} = 28.4\%$$

In addition, the woman in <Figure 1> has a jawline of 15%. Therefore, Song Hae will live richer than this woman.

Figure 4. Song-hae's profile.



Meanwhile, Song-Hae's Total philtrum ratio is 12.2%.

$$\text{Song-Hae's Total philtrum ratio} = (my - ny) / (ay - qy) = 12.2/100 = 12.2\%.$$

Song Hae's total philtrum ratio exceeds 10%, and the philtrum is long, which is considered a good criterion for longevity from a physiognomic point of view. The criteria for judging a person's physiognomy should be based on the statistics by experts, and it is believed that if the correction continues, the standard values will converge.

4. Conclusion

There has been no numerical concept in determining the state of physiognomy or beauty plastic surgery, and there has been a custom that experts and the general public judge by eye measure[30]. Consumers verbally express the purpose of beauty plastic surgery they want, and the service provider listens to it and subjectively determines and deals with the patient's condition through examination if necessary[31][32]. Subjective explanations are important for patients or customers, but it is natural that presenting objective data will increase reliability. Due to the nature of beauty plastic surgery medical services, it is difficult to standardize them because it is not known what medical services each customer receives. Since it is not known what kind of plastic surgery medical services each customer receives, data standardization is a necessary process.

The number of foreigners visiting Korea, the powerhouse of beauty plastic surgery and medical technology, is expected to increase in the future, and the Korean Wave is also expected to have a significant impact on Korea's beauty plastic surgery market[33]. It is believed that numerical standardization of beauty plastic surgery is essential in order to utilize the value of an IT powerhouse and demonstrate cutting-edge technology in this field[34]. For this goal, cooperation with the field of animation development should continue[35][36].

In this paper, when the face is exposed to the screen using modernized devices, the location of the points is automatically input and the results of physiognomy and beauty plastic surgery are derived. Not only the philtrum and jawline, but also the other parts that make up the face such as eyebrows, forehead, and nose can be digitized. Therefore, it is believed that the future task will be to create mathematics and figures of the characteristics of the face and standards for beauty plastic surgery.

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6. Appendix

6.1. Authors contribution

	Initial name	Contribution
Lead Author	JM	-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"/>
		-Final approval of the paper <input checked="" type="checkbox"/>
Corresponding Author*	HJ	-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"/>
		-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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A Study on the State Hair Stylist Licensing System according to the Globalization of the Korean Beauty Industry

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Abstract

Purpose: The beauty industry in Korea has triggered a global syndrome, and in particular, in the beauty industry, which is a labor intensive one highly dependent on human resources, a tool for more efficient and effective manpower management is undergoing discussion on the qualification rating, and hence, it is necessary to study the difference according to job performance.

Method: Those who have obtained a national qualification related to the Korean hair in order to analyze the technical job performance according to the qualification rating of the state hair stylist license acquisition as well as those with over 10 years of field experience were subjected to the questionnaire survey.

Results: For the hair stylist related qualification and licensed practitioners, the general job performance for each qualification such as cut, perm, hair styling, blow dry, hair evaluation and prescription, hair styling proficiency, and professional work, etc., were surveyed, and consequently, it turned out that there was a difference in job performance in the order of master craftsman, technician, and license, and the difference in job performance of license compared to master craftsman turned out to be larger.

Conclusion: Hence, the license issued following the completion of education at universities, etc., has demonstrated a significantly lower job performance compared to the qualification, and in other fields, the qualification system is operated from technician to industrial engineer, and from industrial engineer to master craftsman. However, it is considered that this is so because the qualification system of the beauty area is directly connected to the master craftsman. Accordingly, in order to foster it into a global industry, it would be necessary to improve and supplement specific qualification rating which is realistic, independent, and reflective of the times, moving away from the focus placed on regulations and policies, and as an improvement point and future tasks to be pursued, studies on customer reliability, work habits, interpersonal relationship skills, and quality improvement, which are individual job skills of the state hair stylist license holder, ought to be conducted as well.

[Keywords] State Hair Stylist License, Technician, Job Performance, Master Craftsman, License

1. Introduction

1.1. Need and purpose of the study

The beauty industry continues to change and develop as an industry highly sensitive towards the changes of fashion and times. In particular, it is a labor intensive industry which has to provide labor on a one-to-one basis with customers, and is also highly dependent on human resources. Hence, only a more effective and efficient manpower management will allow gaining an edge in any relevant company's competitiveness.

The customer cannot see the design forms or colors before receiving services, and the same results could not be obtained depending on the skills and expertise of the designer. Unlike industrial products, since the design and quality may vary depending on the designer who

performs the procedure, the beauty designers are developing their beauty skills by acquiring new information through the continuous re-education and learning, and such are directly related to the success and failure of the beauty companies, and hence, the training process for improving the designers' job performance in the beauty related companies is undergoing further enhancement. In line with the fast evolving environment of the beauty industry, the professionalism and talents of hair designers are prioritized [1][2][3], and a system called "qualification" is used to develop performance capabilities and effectively evaluate them [4][5][6][7].

While professional skills and skills are required in modern society, among the important fields to be considered in order to accommodate such demands is qualification, that is, the state technical qualification system [8]. In particular, the demand for fostering talents with creative skills and scientific theories of professional hairstylist who must meet the qualifications according to certain regulations leads to certification [9]. Currently, the qualification system in Korea is divided into the 5 ratings of technician, industrial engineer, engineer, master craftsman, and technician, yet the beauty qualification system is consisted of 2 ratings of beautician and master craftsman, and such is the reality where that some qualification systems are neglected without a complete system in place. Such an unreasonable qualification system turns into an inadequacy in the manpower management due to the difference in negative views between wage level, work environment, and highly educated beauty workers and existing beauty workers, which are among the chronic problems of the beauty industry [10][11]. Furthermore, 8 years of experience are required to obtain the qualification of beautician and pursue master beautician, and the wide gap in terms of the level and difficulty in exams causes an imbalance in the educational system. Given such a contradiction in the beauty qualification system, many beauty professionals who challenge the master beautician qualification give up on acquiring the master beautician qualification at some point in the process [12][13][14].

In particular, as part of the New Economic Five Year Plan with the launch of the civilian government, a lifelong education policy was established and has undergoing settlement along with the reform of the qualification system in the new manpower policy. While the academic credit bank system has been activated, the students majoring in the field of beauty do not receive the benefits of credit recognition for those who have obtained the industrial engineer qualification. Class 1 beautician and class 1 cook were overhauled in 1991, and the cooking industrial engineer was newly established in 1996, yet the beauty industrial engineer was not newly instituted, and the beauty related departments were newly established across all of 140 community colleges entering the 21st century. However, the fact that the students majoring in beauty are not able to apply for industrial engineers is quite unreasonable in that the beauty certification system has differences from other fields [15]. As such has become an impediment to the quantitative and qualitative development of the Korean beauty industry, it should be improved as a beauty qualification system aimed at improving the practical ability of beauticians. Accordingly, it is urgent to systematize the beautician qualification system and establish the legal system, establish a systematic standard and foundation for the globalization of beauty education, and institutionalize the international mutual certification system for beauty qualifications, and a systematic system at the national level should be established to prevent further damages [16]. The previous studies on the qualification system for beauticians include a study on the improvement of the qualification system for beauticians in Korea (Jooyoung Lee et al., 2001) [17], and the qualification system for beauticians and their direction for improvement (Jungseok Son, 2006), etc. [18]. However, in achieving balance for the qualification system, the studies on the rating system other than the studies on the expected effects of the establishment and acquisition of beauty industrial engineer (Youngjoo Lee et al. 2014) [15] are inadequate.

The current beauty qualification system has a weak career leading function and also lacks a unified system for all work items, and hence, the qualification rating system does not offer much help for the professional development of beauticians [19][20]. Furthermore, a more detailed

review is needed to systematize the law at the national level given the reality that the qualification system and licensing system are not used and recognized in other countries[21]. The purpose of this study was to analyze the difference in job performance according to the state qualification for hair acquired and prepare the data on the need for qualification ratings for an accurate qualification system.

2. Research Method

2.1. Research subject

A survey was conducted with those who have acquired the state qualification related to hair and who have over 10 years of field experience among the practitioners active in the beauty industry, as well as the instructors and professors at educational institutions.

2.2. Validity and reliability of the measurement tools

2.2.1. Structure of the measurement tools

It is consisted of questions on gender, age, educational background, and occupation seeking general demographic characteristics, and questions on the differences in job performance according to the state hair qualification.

As for the job evaluation method, Lytle's job evaluation factors (Lytle, 1946)[22] were referred to. The designer evaluation system of franchised hair salon B&G in consideration of the functions of the competency unit design criteria of NCS job analysis promoted by the Human Resources Development Service of Korea and the common and basic elements among the job skills and work capabilities required by the industry were used as the measurement tool by correcting and supplementing the relevant system.

The questions on the differences in job performance according to the acquired state hair stylist license are consisted of 14 questions, and the Likert scale was measured from 'Very much (5 points) to "Not at all (1 point)." As a result of the factor analysis performed, the questions of the 4 factors extracted based on the eigenvalue of 1 were sorted in the order of the magnitude of the factor load, each respectively, and the names of the questions in the sub-domain were reflected.

2.2.2. Validity and reliability of the measurement tool

The factor analysis was performed to examine the validity of the measurement tool for this study. The principal component analysis was performed for all measured variables to extract component factors, and variable max rotation was performed to simplify factor loading. The total variance explained by the eigenvalue of 1.0 or more and the factor loading value of .60 or more turned out to be relatively reasonable at 86.22% for the selection criteria of the questions for this study. The reliability coefficient of Cronbach's α turned out to be greater than .9 to secure the reliability of each factor, and is as illustrated in <Table 1>.

Table 1. Factor analysis and reliability.

Question	Factor 1	Factor 2	Factor 3	Factor 4	Reliability
v2	.876	.197	.185	.242	.901
v9	.725	.188	.414	.225	
v4	.619	.429	.409	.187	

v10	.616	.429	.442	.136	
v3	.289	.753	.198	.403	
v5	.251	.750	.304	.406	.932
v11	.279	.749	.348	.356	
v8	.364	.272	.816	.208	.910
v7	.375	.315	.770	.261	
v6	.205	.321	.194	.855	.906
v1	.254	.389	.214	.800	
Eigenvalue	2.661	2.561	2.163	2.100	
Dispersion (%)	24.195	23.286	19.660	19.088	
Cumulative dispersion (%)	24.195	47.480	67.141	86.229	

2.3. Data collection and analytical method

2.3.1. Collection of data

According to the purpose of this study, and for an empirical investigation, beauty practitioners and professional academies and professional school professors who have obtained the state qualification related to hair and college and university professors, including the beauty related students, full time, adjunct, and part time instructors, were set as the research subjects. This survey was conducted for 15 days from October 10, 2021 until October 24, 2021, by distributing the questionnaire directly to the operators of beauty related academies, vocational schools, and beauty re-educational institutions located nation widely, and the questionnaire was self-reported for completion directly by the subjects of the questionnaire, while the self-administered questionnaire survey method was used. A total of 1,500 questionnaires were distributed for data collection, and 1,385 copies of the distributed questionnaires were recovered, which demonstrated a recovery rate of 92.3%. Among the recovered 1,385 questionnaires, 1,224 questionnaires were confirmed as valid samples, excluding the 161 questionnaires with insincere responses, and were used for analysis.

2.3.2. Data's analytical method

Statistical analysis of the collected data was performed by using SPSS 18.0 to analyze the demographic characteristics of the subjects of the survey, and the factor analysis was performed for the validity and reliability of the questionnaire's questions for each variable. The reliability analysis, t-test, and the one-way ANOVA were performed to analyze the differences in job performance, and Scheffe was performed as an ex post analysis. Furthermore, all differences were verified at the significance level of $p < 0.05$. That is, when the significance probability of p is less than the significance level of 0.05, it means that there is a difference in perception between the groups.

3. Research Results and Discussion

3.1. General characteristics of the survey subjects

It turned out that there were 917 women (technician : 79.2%; master craftsman : 16.7%; license 4.1%) and 307 men (technician : 70%; master craftsman : 22.5%; license : 7.5%), respectively.

By age, technicians were the most in their 30s (89.2%), while master craftsman was in their 50s (40.2%), and license were in their 20s (8.9%), in terms of the differences by age as per the qualification system.

It turned out that, when asked about their major, 54.4% (666 people) were the beauty related majors, among whom 70.3% were technicians, 24.8% were master craftsman, and 5% were license, respectively.

As for the question of occupation, the beauty practitioners had the highest rate of 49.1%, and professional academies and vocational school professors were second with 16.9%, and among technicians by the certification acquired, the beauty related students accounted the most with 92.2%, and among the master craftsmen, college and university professors (full time, adjunct, and part time instructor) were the highest at 51.5%, as illustrated in <Table 2>.

Table 2. General characteristics of the study subjects.

(N=1,224, %)

Questions		Types of license			Rowtotal(%)	χ^2 (df)
		Technician	Master craftsman	License		
Gender	Men	215	69	23	307	11.924** (2)
		70.0	22.5	7.5	100.0	
		22.8	31.1	37.7	25.1	
	Women	726	153	38	917	
		79.2	16.7	4.1	100.0	
		77.2	68.9	62.3	74.9	
Majors	Beauty related majors	468	165	33	666	43.788*** (2)
		70.3	24.8	5.0	100.0	
		49.7	74.3	54.1	54.4	
	Beauty related non-majors	473	57	28	558	
		84.8	10.2	5.0	100.0	
		50.3	25.7	45.9	45.6	
Occupation	Beauty practitioners	462	111	28	601	150.088*** (8)
		76.9	18.5	4.7	100.0	
		49.1	50.0	45.9	49.1	
	Professors at professional academies and vocational schools	155	48	4	207	
		74.9	23.2	1.9	100.0	
		16.5	21.6	6.6	16.9	
	Beauty related students	177	4	11	192	
		92.2	2.1	5.7	100.0	
		18.8	1.8	18.0	15.7	
	College and university professors (full-time, adjunct, part-time lecturer)	49	53	1	103	
		47.6	51.5	1.0	100.0	
		5.2	23.9	1.6	8.4	
	Others	98	6	17	121	
		81.0	5.0	14.0	100.0	
		10.4	2.7	27.9	9.9	
Column total (%)		941	222	61	1224	
		76.9	18.1	5.0	100.0	
		100.0	100.0	100.0	100.0	

Note: *P<0.05, **P<0.01, ***P<0.001.

3.2. State hair certification acquired by rating

<Table 3> illustrates the differences in the actual status of certification acquired according to the acquired state hair stylist license. Among the 1,224 respondents, there were 941 technicians, 222 master craftsman, and 61 licenses, of whom 917 were female (technician : 79.2%; master craftsman : 16.7%; license : 4.1%), and 307 were male (technician : 70%; master craftsman : 22.5%; license : 7.5%).

Table 3. State certification acquired for hair by rating.

State hair stylist license acquired	Independent variable	B	β	t		R ²	Correction R ²	F
Technician	(Constant)	0.867		16.533	***	0.444	0.443	748.843 ***
	Benefit	0.599	0.666	27.365	***			
Master craftsman	(Constant)	1.557		13.724	***	0.049	0.044	11.282 **
	Benefit	0.155	0.221	3.359	**			
License	(Constant)	0.895		2.996	**	0.285	0.273	23.573***
	Benefit	0.544	0.534	4.855	***			

Note: **P<0.01, ***P<0.001.

3.3. Differences in job performance in technical aspects according to the state hair stylist license acquired

Among the qualifications answered about by the respondents, only the final rating of certification was used for the analysis, and those who responded that they acquired both the beautician's and master beautician's certifications were excluded from the analysis, and consequently, it turned out that there was a significant difference according to the rating of the state hair certification acquired.

3.3.1. Job performance related to the basic skills of the holder of the state hair stylist license acquired

In the case of cutting techniques divided into those of scissors, cleaver, and razor, the job performance of the group which acquired the master craftsman certification turned out to be the largest among the 3 groups, followed by technician with the lowest job performance of license. Other than which, permanent wave technology, hair coloring technology, correction service technology to correct incorrect procedures, cut, perm, dyeing, styling blow dry, roll setting, iron handling, other hair, up star job skills related differences turned out to be in the order of master craftsman, technician, and license, among which master craftsman demonstrated the largest in terms of the use of scissors (4.18), clipper (4.15), and razor (4.11) in terms of cutting skills, as illustrated in <Table 4>.

Table 4. Job performance related to the basic skills of the state hair stylist license holder.

Job performance		Classification		M		S.D	F	
Cutting technique	Scissors	Technician	(N=941)	3.04	B	0.93	168.994	***
		Master craftsman	(N=222)	4.18	A	1.01		
		License	(N= 61)	2.16	C	1.00		

	Clippers	Technician	(N=941)	2.80	B	1.06	165.113	***
		Master craftsman	(N=222)	4.15	A	0.93		
		License	(N= 61)	2.43	C	0.83		
	Razor	Technician	(N=941)	2.74	B	1.11	159.296	***
		Master craftsman	(N=222)	4.11	A	0.91		
		License	(N= 61)	2.31	C	0.87		
Permanent wave technique	Cold permanent wave	Technician	(N=941)	3.00	B	0.99	82.794	***
		Master craftsman	(N=222)	3.81	A	0.88		
		License	(N= 61)	2.33	C	1.00		
	Heat permanent wave	Technician	(N=941)	2.79	B	1.08	111.810	***
		Master craftsman	(N=222)	3.88	A	0.99		
		License	(N= 61)	2.18	C	0.99		
Hair coloring technique	Root dye	Technician	(N=941)	3.15	B	0.84	82.090	***
		Master craftsman	(N=222)	3.91	A	0.87		
		License	(N= 61)	2.82	C	0.83		
	Weaving (dyeing, highlighting)	Technician	(N=941)	3.03	B	0.96	96.101	***
		Master craftsman	(N=222)	3.95	A	0.87		
		License	(N= 61)	2.64	C	0.84		
	Intensive Highlighting	Technician	(N=941)	2.78	B	1.10	108.909	***
		Master craftsman	(N=222)	3.90	A	0.90		
		License	(N= 61)	2.49	C	0.79		

Note: ***P<0.001, The ex post test results are expressed as A>B>C.

3.3.2. Professional and technical job performance of the state hair stylist license holder

In terms of the technical job performance of correction service, fashion and originality, skill level, hair evaluation and prescription, and professional work, they all turned out to be in the order of master craftsman, technician, and license, respectively. Among which, it turned out that there was a significant difference between the skilled workers in the correction service's cut (4.09), permanent wave (3.88), and hair coloring (3.87), as illustrated in <Table 5>.

Regarding the Korean beautician license, the Cosmetic Industry Team (2008) of the Korea Health Industry Promotion Agency's Policy Development Unit has announced its position on the act of equally evaluating different academic levels such as advanced technical schools, high schools, and vocational colleges and issuing the same license, and the issue of declining credibility of license and equality following the issuance of license without testing as well as the issue of equality for those who acquired license without testing and those who qualified the state technical certification exam[23], and it is considered that the reported opinion claiming that beginners, license holders, and managers all oppose the issuance of the exam-less license should also be considered[24].

Table 5. Differences in the professional and technical job performance of the state hair stylist license holders.

Correction service	Cut	Technician	(N=941)	2.90	B	0.90	183.456	***
		Master craftsman	(N=222)	4.09	A	0.85		
		License	(N= 61)	2.41	C	0.78		
	Permanent wave	Technician	(N=941)	2.87	B	0.97	111.997	***
		Master craftsman	(N=222)	3.88	A	0.87		
		License	(N= 61)	2.51	C	0.81		
	Hair coloring	Technician	(N=941)	2.86	B	0.96	108.939	***
		Master craftsman	(N=222)	3.87	A	0.88		
		License	(N= 61)	2.64	C	0.75		
	Hair conditioning	Technician	(N=941)	2.94	B	0.99	81.090	***
		Master craftsman	(N=222)	3.80	A	0.87		
		License	(N= 61)	2.57	C	0.76		
Trend and creativity	Creative cut	Technician	(N=941)	2.89	B	0.96	99.880	***
		Master craftsman	(N=222)	3.79	A	0.91		
		License	(N= 61)	2.33	C	0.75		
	Creative hair permanent wave	Technician	(N=941)	2.83	B	0.98	107.179	***
		Master craftsman	(N=222)	3.77	A	0.85		
		License	(N= 61)	2.21	C	0.92		
	Creative hair coloring	Technician	(N=941)	2.94	B	1.00	92.261	***
		Master craftsman	(N=222)	3.83	A	0.82		
		License	(N= 61)	2.41	C	0.80		
	Creative hair styling	Technician	(N=941)	2.90	B	1.06	110.079	***
		Master craftsman	(N=222)	3.94	A	0.84		
		License	(N= 61)	2.33	C	1.03		
	Blow dry	Technician	(N=941)	3.03	B	0.87	157.832	***
		Master craftsman	(N=222)	3.99	A	0.76		
		License	(N= 61)	2.15	C	0.91		
Hair styling Related proficiency	Roll setting	Technician	(N=941)	2.95	B	0.96	75.714	***
		Master craftsman	(N=222)	3.65	A	0.80		
		License	(N= 61)	2.23	C	0.94		
	Handling iron	Technician	(N=941)	3.07	B	0.92	85.483	***
		Master craftsman	(N=222)	3.71	A	0.83		
		License	(N= 61)	2.13	C	0.89		
	Braided	Technician	(N=941)	2.84	B	1.04	36.308	***
		Master craftsman	(N=222)	3.35	A	1.03		
		License	(N= 61)	2.21	C	0.99		

	Up style	Technician	(N=941)	2.81	B	1.01	59.423	***
		Master craftsman	(N=222)	3.50	A	1.08		
		License	(N= 61)	2.15	C	0.83		
Hair evaluation and prescription	Knowledge of prices, services and products	Technician	(N=941)	3.24	B	0.88	56.442	***
		Master craftsman	(N=222)	3.91	A	0.74		
		License	(N= 61)	3.21	B	0.82		
	Efficient consultation	Technician	(N=941)	3.16	B	0.90	55.559	***
		Master craftsman	(N=222)	3.77	A	0.73		
		License	(N= 61)	2.75	C	0.83		
	Sales of additional services	Technician	(N=941)	3.01	B	0.89	50.397	***
		Master craftsman	(N=222)	3.64	A	0.83		
		License	(N= 61)	2.80	A	0.81		
	Sales of products	Technician	(N=941)	2.99	B	0.87	61.609	***
		Master craftsman	(N=222)	3.64	A	0.84		
		License	(N= 61)	2.59	C	0.74		
Professional work	Ownership of the necessary equipment	Technician	(N=941)	3.21	B	0.78	27.573	***
		Master craftsman	(N=222)	3.79	A	0.78		
		License	(N= 61)	2.75	C	0.77		
	Maintenance of clean and tidy equipment	Technician	(N=941)	3.34	B	0.85	37.281	***
		Master craftsman	(N=222)	3.79	A	0.65		
		License	(N= 61)	2.93	C	0.91		
	Compliance with laws and regulations for sanitation control	Technician	(N=941)	3.33	B	0.84	32.284	***
		Master craftsman	(N=222)	3.77	A	0.62		
		License	(N= 61)	3.08	C	0.76		
	Compliance with safety rules	Technician	(N=941)	3.40	B	0.87	25.644	***
		Master craftsman	(N=222)	3.84	A	0.65		
		License	(N= 61)	3.39	B	0.76		

Note: ***P<0.001, The ex post test results are expressed as A>B>C.

4. Conclusion and Recommendations

Considering the fact that the rating system needs to secure a midpoint between career development and career path to achieve effects such as strengthening one's will for self-development, the design of the rating system for qualifications promotes the individual ability development and facilitate the industrial field and vocational education and training, while playing a role in establishing the infrastructure for the national human resource development which is linked thereto, thereby playing a role as a medium for the creation of a lifelong learning society.

Qualifications must be able to transparently represent the information of the holder of the qualification, and hence, it must be designed as a qualification system which is resilient and

flexible to changes in the industry and technology or social needs, and also provide confidence in the manpower needed for the beauty industry. If such can be done, the license holders will be able to actively challenge acquiring qualifications and also apply the contents of education and training in practice.

Qualifications must be compatible with the field, and hence, it is necessary to classify appropriate qualifications to ensure that the number of qualification ratings and the name of qualification ratings can be adjusted for the social treatment of the beauty industry.

As a result of studying the difference in job skills for the state hair stylist license acquired, the difference in job skills between master craftsman and technician turned out to be large in the order of master craftsman, technician, license, and holder, respectively. Moreover, it is often the case that technicians and license holders give up on pursuing master craftsman.

Hence, for fostering beauty into a global industry, it is necessary to improve and supplement specific qualification rating which are realistic, independent, and reflective of the times away from the focus placed on regulations and policies. As an issue of improvement and future tasks to be pursued, studies on the customer reliability, work habits, interpersonal relationship skills, and quality improvement, which are individual job skills of the state hair stylist license holder, also ought to be carried out.

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7. Appendix

7.1. Authors 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*	DL <ul style="list-style-type: none"> -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"/> -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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An Analysis of Trends in Christian Bibliotherapy in Korea: With a Focus on the Papers Published in 2003-2022

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Abstract

Purpose: The purpose of this study is to analyze the research trends of the Christian bibliotherapy related papers published in Korea over the past two decades.

Method: This study was conducted with the papers extracted with the topic of 'Christian bibliotherapy' from among the papers published in Korea from 2003 to 2022 and the papers published in specialized academic journals. The papers to be analyzed were searched and collected with the topic of 'Christian bibliotherapy' for the papers published in academic journals as well as the dissertations for master's and doctoral degrees, which were published from 2003 until 2022 via the database within the search site of the Korea Education and Research Information Service (<http://www.riss.co.kr>). They were also included in the cases where bibliotherapy was performed with the Bible in addition to the Christian bibliotherapy.

Results: As a result of this study, future research on Christian bibliotherapy needs to increase the studies on clinical bibliotherapy targeting various age groups, clarify the specific process of bibliotherapy, and needs to be supplemented with the studies on the process of training Christian bibliotherapy experts.

Conclusion: This study will provide the basic data for the Christian bibliotherapy related studies, and will further present future research directions for the Christian bibliotherapy researchers.

[Keywords] Bibliotherapy, Christian Bibliotherapy, Research Trends, Research Content Analysis, Research Subject Analysis

1. Introduction

1.1. Need and purpose of the study

The pandemic situation has brought about changes across many fields[1]. The experience of disasters caused by COVID-19 has brought about a variety of negative effects on the individuals and society, and the trauma of a disaster leads to shock in phases even after the disaster is over[2]. In fact, the stress caused by COVID-19 has had a significant negative correlation with the quality of life[3], and as emotional anxiety and depression increased due to the disaster, the mental power of many people has weakened[4].

Accordingly, as the interest and research on bibliotherapy are active, the need to classify and develop reading materials appropriate for the situation is growing. It is a task in the field of bibliotherapy research for one to select existing good literary works, make a list of bibliotherapy materials according to the situation, and develop a book from a therapeutic perspective to help in various problem related situations[5]. Bibliotherapy is designed to help the trained therapists integrate emotional and cognitive responses through the therapeutic interactions while inducing and leading discussions of printed texts, audiovisual materials, and the participants' own creative writings as literary works[6], and the use of books carries the meaning of promoting

mental health, solving personal problems, and letting people know what social interest is about[7].

'Christian bibliotherapy' is a method of bibliotherapy, and if the general bibliotherapy uses only general books as data, the Christian bibliotherapy uses not only general books, but also the Bible and Christian books, which are the Words of God, as the texts for bibliotherapy. The purpose of the Christian bibliotherapy is to achieve the goal of Christian counseling 'to establish a perfect person in Christ[8]', and to help alleviate the emotional conflicts by analyzing and exploring the psychology of people suffering from mental and physical difficulties[9]. Furthermore, the Christian bibliotherapy can be an active, therapeutic, and preventive solution for resolving social problems[10], and the messages in the Bible, Christian books, and general books with therapeutic resources make the readers aware of the difficulties the protagonist is experiencing, thereby allowing them to vicariously gain satisfaction through immersion[11].

That is, the Christian bibliotherapy provides a therapeutic solution for the clients through the medium of books and plays an encouraging role as the Christian counseling method. Accordingly, the Christian bibliotherapy can not only relieve the negative effects of COVID-19, enable true communication of emotions, but also help improve the quality of life for the religious people across all ages and genders at a relatively low cost compared to the other treatment programs. However, while the general bibliotherapy research has been consisted of 323 studies over the past 5 years, and the related studies and applications have been relatively active both academically and clinically, the Christian bibliotherapy studies have not been sufficiently studied as there are only 46 studies over two decades. Hence, the bibliotherapy research trends have been actively analyzed by various scholars[9][12][13][14][15][16][17][18][19][20][21][22][23][24][25], yet the trend analysis of the Christian bibliotherapy has not yet been conducted whatsoever.

As such, the number of studies on the Christian bibliotherapy in Korea is very minimal, and hence, this study seeks to analyze the research trends for approximately 20 years from 2003 to 2022, when the Christian bibliotherapy was conceived in Korea. By reviewing the history of the modern Christian bibliotherapy and examining the trends of such studies, it is intended to lay the foundation for the further development of the Christian bibliotherapy moving forward.

2. Research Method

2.1. Subject of data analysis

This study was conducted with the papers extracted with the topic of 'Christian bibliotherapy' from among the papers published in Korea from 2003 to 2022 and the papers published in specialized academic journals. The papers to be analyzed were searched and collected with the topic of 'Christian bibliotherapy' for the papers published in academic journals as well as the dissertations for master's and doctoral degrees, which were published from 2003 until 2022 via the database within the search site of the Korea Education and Research Information Service (<http://www.riss.co.kr>). They were also included in the cases where bibliotherapy was performed with the Bible in addition to the Christian bibliotherapy.

The Christian bibliotherapy ought to include the function of the Bible as the bibliotherapy data given its nature. This is because the Bible is defined as a book[26] which has become a spiritual food for the Christians in the history of mankind for millennia and which clearly shows the footsteps of man and the revelations of God for all. Hence, in this study, the bibliotherapy studies using the Bible were also included in the Christian bibliotherapy, which was defined as the Christian bibliotherapy and included for the analysis.

In this study, the paper and journal paper published in Korea published with the Korea Education and Research Information Service (<http://www.riss.co.kr>) were searched and analyzed,

while the cases where the original text was not disclosed among the dissertations or journal papers were excluded. The research materials which were not searched in RISS were requested to the National Library of Korea and provided with some copies and included for the analysis. As a result, the number of dissertations analyzed in this study was a total of 46 dissertations published in the field of Christian bibliotherapy for Christians in Korea from 2003 to 2022, including 35 dissertations and 11 papers for the domestic specialized academic journals. Table 1 illustrates the number of papers by year and presentation type of the Christian bibliotherapy used for the data analysis.

Table 1. Number of papers by year and presentation type.

Year	Dissertations		Academic paper	Total	(%)
	Master's	Doctoral			
2003	1			1	2.2%
2004	1			1	2.2%
2005	3		1	4	8.7%
2006					
2007	2			2	4.3%
2008	4		2	6	13.0%
2009	3	4		7	15.2%
2010	3			3	6.5%
2011	2		1	3	6.5%
2012	2	1	3	6	13.0%
2013	2	1	2	5	10.7%
2014	1			1	2.2%
2015					
2016	1			1	2.2%
2017			1	1	2.2%
2018	1			1	2.2%
2019	1			1	2.2%
2020			1	1	2.2%
2021		1		1	2.2%
2022	1			1	2.2%
Total	28	7	11	46	100%
	60.9%	15.2%	23.9%		

According to the data collected for this study, after the production of the first dissertation on the Christian bibliotherapy in 2003, with the exception of 2006 and 2015, more than one Christian bibliotherapy paper has been produced each year, for a total of 46. Among which, there were 35 dissertations, accounting for 76% of the total, and 11 papers, or 24%, were published in the academic journals. In particular, the master's dissertations accounted for the highest percentage among the total analysis target paper with 28 (60%). On the other hand, the doctoral dissertations had the lowest ratio with 7 (17%), respectively.

2.2. Data analysis and the analytical criteria

The analysis criteria for analyzing the Christian bibliotherapy research trends referred to criteria such as [9][12][13][14][15][16][17][18][19][20][21][22][23][24][25], and the analysis was performed by classification by academic area, research subject, research topic, research type of the program, and the book used in the Christian bibliotherapy program, and the relevant frequency and percentage were expressed as statistics. Furthermore, the parts which the researcher considered necessary for the Christian bibliotherapy were the books used in the Christian bibliotherapy program, the words of Bible and subjects used in the Bible bibliotherapy program, the words of Bible used in the Christian bibliotherapy program and the number of times and the subjects were additionally classified for analysis in consultation with a PhD holder specialized in Christianity.

2.2.1. Analytical criteria for academic area

The Christian bibliotherapy research is being conducted across various fields such as library and information science, education, Christian counseling, theology, mission studies, practical theology, social welfare and other humanities. The dissertations were classified into majors when degrees are conferred, and academic areas were classified based on the characteristics of the graduate school or the name of the department. In the case of papers for academic journals, the academic areas were classified according to the nature of the journal's publisher and the author's major or affiliation. The title of the paper, year of publication, the researcher's affiliated institution and the current status of the researcher's major in the field of study, research contents and methods were documented for records.

Table 2. Analytical criteria for academic area.

Criteria	Details	
Academic area	Library and information science	Library and information science, library informatics
	Christian counseling studies	Theology and counseling studies, Christian counseling studies, biblical counseling studies
		Counseling psychology, family ministry counseling, counseling, family counseling
	Theology	Practical theology, theology, mission studies, healing ministry, mission theology
	Literature	bibliotherapy, reading studies, psychodrama society
	Education studies	Christian education studies, childhood education studies, general social education
	Others	Social welfare studies

2.2.2. Criteria for research subject analysis

The criteria for analyzing the characteristics of the research subjects were classified into individual factors and environmental factors, which are the characteristics of the research subjects as illustrated in <Table 5>. Individual factors were classified into the areas of general, maladjustment, emotion, stress, and spiritual growth. In the case of research subjects with normal cognition and emotion, and in the case of general and social maladjustment, they were classified into maladaptation, depression, and low self-esteem, and in the case of interpersonal relationship related difficulties, they were classified into emotion, and in the case of high risk group of stress, they were classified into stress, and in the case of spiritual recovery and spiritual growth, they were classified into spiritual growth. As for the environmental factors, they were classified into average families and single-parent families.

Table 3. Analytical criteria for each factor for study subjects.

Criteria	Details	
Personal factor	Average	Average level of cognition and emotion
	Maladaptation	Social maladaptation
	Emotion	Depression, low self-esteem, and difficulties of interpersonal relationship
	Stress	High risk of stress
	Spiritual growth	Spiritual recovery, spiritual growth
Environmental factor	Average family	Average family
	Single-parent family	Families of divorced parents, families of grandparents and grandchildren

2.2.3. Criteria for research topic analysis

Research trends were examined and understood by classifying the research topic into 3 aspects. Cognitive aspects related to cognitive change and learning, emotional aspects related to emotional changes, and socio-cultural aspects related to interpersonal relationships or social skills, church life, and the leadership and cultural adaptation were classified.

Table 4. Analytical criteria for research topics.

Criteria	Details	
Research topic	Cognitive aspects	Learning motivation, self-efficacy, academic stress, Bible reading skills
	Emotional aspects	Stress (daily stress, stress coping behavior) Self related (self-esteem, self-respect, self resilience, self resilience, self-expression, self-efficacy, self recovery resilience)
	Socio-cultural aspects	Interpersonal relationship, social skills, church life, school life, leadership, cultural adaptation, family relationship

3. Research Results

3.1. Research trends according to the analytical criteria for academic area

<Table 5> illustrates the current status of the Christian bibliotherapy by academic area, and <Table 6> illustrates the status of Christian bibliotherapy's research methods by academic area.

As examined in <Table 5>, it is apparent that various studies are conducted for the Christian bibliotherapy across various fields such as library information science, Christian counseling, education, theology, and literature, and that the academic area has been extensively attempted. However, until 2014, there were 39 studies, which accounted for 85% of the total, yet from 2015 to 2022, there were only 7 studies, accounting for 15% of the total number of papers. This means that the number of the Christian bibliotherapy related studies has continued to decline.

Table 5. Status by year according to academic area.

Year of publication	Library and information science	Christian Counseling studies	Education studies	Theology	Literature	Total
2003				1		1(2.2%)

2004				1		1(2.2%)
2005		2	1		1	4(8.7%)
2006						
2007			1	1		2(4.3%)
2008	1	2		1	2	6(13.0%)
2009		4		3		7(15.2%)
2010			3			3(6.5%)
2011		1		1	1	3(6.5%)
2012	1	3	1	1		6(13.0%)
2013		2		2	1	5(10.9%)
2014			1			1(2.2%)
2015						
2016			1			1(2.2%)
2017		1				1(2.2%)
2018		1				1(2.2%)
2019				1		1(2.2%)
2020				1		1(2.2%)
2021				1		1(2.2%)
2022		1				1(2.2%)
Total	2(4.3%)	17(37.0%)	8(17.4%)	14(30.4%)	5(10.9%)	46(100%)

As illustrated in <Table 6>, the number of research method related papers by academic area of the Christian bibliotherapy was the largest with 21 (45.7%) out of a total of 46 research papers, followed by effect studies with 13 (28.2%) and trend analysis was 7 (15.2%), and program development studies was 5 (10.9%), respectively.

Table 6. Current status of research method by academic area.

Research method	Academic area					Total
	Library and information	Christian counseling	Education studies	Theology	Literature	
Case studies	2	12	1	4	2	21 (45.7%)
Program development studies	0	2	0	2	1	5 (10.9%)
Effectiveness studies	0	2	5	6	0	13 (28.2%)
Trends analytical studies	0	0	3	2	2	7 (15.2%)
Total	2 (4.3%)	16 (34.8%)	9 (19.6%)	14 (30.4%)	5 (10.9%)	46 (100%)

3.2. Research trends according to the analytical criteria for research subjects

Of the 46 papers to be analyzed, the subjects and the number of participants were analyzed for 24 studies except for 21 theoretical research types. As illustrated in <Table 7>, the research subjects were classified into adults, young adults, adolescents (14-19 years old), and children

(8-13 years old) by age. The number of participants in the study was also analyzed by setting the criteria as 1 person, 2~5 people, 6~10 people, and 11~15 people for each program treatment.

As a result, as illustrated in <Table 7>, the majority of studies targeting 'middle-aged adults' were 58.3%, 'young adults' were 29.2%, 'youths' were 8.3%, and 'children' were 4.2%, respectively. As for the number of participants for the experimental group, '6-10 people' had the largest number of 9 papers (37.5%), '1 person' had 7 papers (29.2%), and '2-5 people' had 5 papers (20.8%). and '11-15 people' (12.5%), respectively. Gathering which, it is apparent that the Christian bibliotherapy group is mostly conducted for the group of '6-10 people' gathered for among the 'middle-aged adults.'

Table 7. Number of papers by the number of participants of study subjects and by subject.

No. of participants	By subject				Total
	Middle-aged adults	Young adults (20-before marriage)	Youths (14-19 years old)	Children (8-13 years old)	
1 person	4	2	0	1	7(29.2%)
2-5 people	3	1	1	0	5(20.8%)
6-10 people	4	4	1	0	9(37.5%)
11-15 people	3	0	0	0	3(12.5%)
Total	14(58.3%)	7(29.2%)	2(8.3%)	1(4.2%)	24(100%)

Following which, as a result of classifying the characteristics of the research subjects participating in the Christian bibliotherapy by individual factors, 'emotion' was the largest at 33.3%, followed by 'general' (25.0%), 'misadaptation' (20.8%), 'stress' (12.5%), and 'spiritual growth' (8.3%), respectively. This means that the Christian bibliotherapy is not aimed at a specific target, yet it is also possible for the average people with general cognition and emotion. On the other hand, the fact that the Christian bibliotherapy turned out to be the least for the purposes of spiritual growth indicates the fact that the characteristic which shows that the Christian bibliotherapy is helpful for the spiritual growth is not included.

Table 8. Status of characteristics of personal factor of study subjects.

Type	Details	By subject				Total
		Middle-aged adults	Young adults (20-before marriage)	Youths (14-19 years old)	Children (8-13 years old)	
Personal factor	Average	4	2	0	0	6(25.0%)
	Maladaptation	1	3	1	0	5(20.8%)
	Emotion	6	0	1	1	8(33.3%)
	Stress	2	1	0	0	3(12.5%)
	Spiritual growth	1	1	0	0	2((8.3%)
Total		14(58.3%)	7(29.2%)	2(8.3%)	1(4.2%)	24(100%)

As illustrated in <Table 9>, the environmental factors of the research subjects turned out to be general (91.6%) and single-parent families (8.4%).

Table 9. Status of characteristics of environmental factors of study subjects.

Type	Details	Age				Total
		Middle-aged adults	Young adults (20-before marriage)	Youths (14-19 years old)	Children (8-13 years old)	
Environmental factor	Average	13	7	1	1	22(91.6%)
	Single-parent family	1	0	1	0	2(8.4%)
Total		14(58.3%)	7(29.1%)	2(8.4%)	1(4.2%)	24(100%)

3.3. Research trends according to research topics

63.0% of the studies conducted in the field of Christian bibliotherapy were conducted with the topic of 'emotional aspects related to emotional change,' 19.6% of the total papers had the top of 'socio-cultural aspects,' and 17.4% had 'cognitive aspects' as the research topic. As for research topics by academic area, the research topic of 'emotional aspects' were the largest at 63.0%, followed by 'social aspects' and 'cognitive aspects,' respectively.

Table 10. Number of papers for academic area by research topic.

Academic area	Research topics			Total
	Cognitive aspects	Emotional aspects	Socio-cultural aspects	
Library and information science	0	2	0	2(4.3%)
Christian counseling studies	2	10	4	16(34.8%)
Education studies	4	3	2	9(19.6%)
Theology	2	9	3	14(30.4%)
Literature	0	5	0	5(10.9%)
Total	8(17.4%)	29(63.0%)	9(19.6%)	46(100%)

Next, in order to determine whether various factors were included in a study, the factors in terms of cognitive, emotional, and socio-cultural aspects were classified and examined in further detail.

The expected effects from the cognitive aspects of the Christian bibliotherapy may be summarized into 7 types. As illustrated in <Table 11>, in terms of 'education,' 'Christian character education,' 'biblical character education,' 'Christian spirituality formation education,' and 'children's understanding of God' were set as the expected effects and the study was conducted accordingly. In terms of 'Christian counseling,' 'academic stress' and 'Bible reading comprehension' were set for the expected effects. In terms of 'theology,' there was a study which set one's 'ability to understand the Bible' for the expected effect.

Table 11. Detailed factor analysis of cognitive aspects by academic area.

Academic area	Detailed factors of cognitive aspects	Total
Christian counseling studies	Academic stress, bible reading skills	2(25%)
Education studies	Christian character education, biblical character education, Christian spirituality formation education, children's understanding of God	4(50%)

Theology	Ability to understand Bible	2(25%)
Total		8(100%)

<Table 12> illustrates the expected effect of bibliotherapy in terms of the emotional aspects. Among the detailed factors of the emotional aspects, the 'self' related studies which set 'self-esteem,' 'self-respect,' 'self-resilience,' 'self-expression,' 'self-efficacy,' and 'self recovery resilience' for the expected effects turned out to be the largest at 71.4 %, while the 'stress' related studies which set 'everyday stress' and 'stress coping behavior' for the expected effects turned out to be 25.0%, and the studies related to 'empathy' turned out to be 3.6%, respectively.

Table 12. Analysis of detailed factors of emotional aspects by academic area.

Academic area	Detailed factors of emotional aspects			Total
	Self	Stress	Ability to empathize	
Library and information science	1	1	0	2(7.1%)
Christian counseling studies	9	1	0	10(35.7%)
Education studies	3	0	0	3(10.7%)
Theology	3	4	1	8(28.6%)
Literature	4	1	0	5(17.9%)
Total	20(71.4%)	7(25.0%)	1(3.6%)	28(100%)

<Table 13> illustrates the expected effects of the Christian bibliotherapy in terms of the socio-cultural aspects. As a result of classifying the expected effects such as 'interpersonal relationship,' 'church life,' and 'social skills,' the expected effects turned out to be in the order of 'interpersonal relationship' (55.6%), 'church life' (33.3%), and 'social skills' (11.1%), respectively.

Table 13. Analysis of detailed factors of socio-cultural aspects by academic area.

Academic area	Detailed factors of socio-cultural aspects			Total
	Interpersonal relationship	Church life	Social skills	
Christian counseling studies	3	1	0	4(44.5%)
Education studies	1	0	1	2(22.2%)
Theology	1	2	1	3(33.3%)
Total	5(55.6%)	3(33.3%)	1(11.1%)	9(100%)

3.4. Number of papers by research type for the christian bibliotherapy program

The number of papers by research type for the Christian bibliotherapy program turned out to be 41.3% for literature research, 32.6% for qualitative research, 23.9% for quantitative research, and 2.2% for integrated research, respectively. This illustrates the fact that the Christian bibliotherapy program is primarily consisted of literature research.

Table 14. Number of papers by research type of the Christian bibliotherapy program.

	Dissertations		Academic journal papers	Total	(%)
	Master's	Doctoral			
Literature studies	16	1	2	19	41.3%
Quantitative studies	5	2	4	11	23.9%
Qualitative studies	7	4	4	15	32.6%
Integrated studies (quantitative + qualitative)	0	0	1	1	2.2%
Total	28(60.9%)	7(15.2%)	11((23.9%)	46	100%

3.5. Books used by the christian bibliotherapy program

To understand the books used for the Christian bibliotherapy program, their cumulative total was examined. The books selected 10 times, the most for the Christian bibliotherapy, were the picture books, whose title turned out to be 'You Are Special.' This indicates the fact that the type of book which may easily be used for the Christian bibliotherapy is the picture book. Eunju Kang (2019) claimed that the bibliotherapy using picture books is not only target the effect of bibliotherapy for a single age group, but also an effective psychotherapy method for the adults to achieve harmony and the recovery of relationship with their family.

<Table 15> is a list of the general books used for the Christian bibliotherapy.

Table 15. Books used for the Christian bibliotherapy.

Ranking	No. of selections	Title of book
1	4	There is No Mountain We Can't Climb (Youngwoo Kang)
1	4	A Seagull's Dream (Richard Bark)
3	3	Our Happy Time (Jiyoung Gong)
3	3	Rest after 30 years (Mooseok Lee)
5	2	Finding God in Marriage (Gary Thomas)
5	2	Wounds and Pains of the Heart That Need to be Healed Before Marriage (Seotaek Joo)
5	2	Knowing Husband's Personality Makes You Happy (Jihye Song and Baekyong Lee)
5	2	Psychology of Interpersonal Relationship (Kyungja Hong)
5	2	The Art of Conversation (Follett Dale)
5	2	Two People (Iwona Chmielewska)
5	2	Tuesdays with Morrie (Mitch Albom)
5	2	A Married Couple : Close and Distant Companions (Ludwig Schindler)
5	2	Spiritual Styles (Gary Thomas)
5	2	Healing of Disguised Anger (Hyunjoo Choi)
5	2	Life Lessons (Elizabeth Kubler-Roth, David Kessler)
5	2	God in Working Clothes / God in Suits (Terry Iser)
5	2	God, How Can I Raise My Child? (Jinkyong Park)

5	2	Creating a Happy Couple (The Fryings)
5	2	A Happy Janitor (Monica Pat)
5	2	Lotus in a Sea of Fire (Thich Nhat Hanh)
5	2	Men Are from Mars, Women Are from Venus (John Gray)
5	2	Five Intimate Perspectives (Les Parrott, Leslie Parrott)
Others (books used once): 114 books		

The key picture books used for the Christian bibliotherapy are as illustrated in <Table 16>.

Table 16. Picture books and story books used for the Christian bibliotherapy program.

Ranking	No. of selections	Title of book
1	10	You Are Special (Max Lucado)
2	5	The Wall (Gloria J. Evans)
3	4	Hen Out on the Yard (Seonmi Hwang)
4	3	Piggybook (Anthony Brown)
5	2	My Heart, The House of Christ (Robert Meng)
5	2	Because I Love You (Max Lucado)
5	2	Love You Forever (Robert Munsch)
Others (list of picture books used once) : 61 books		

The Bible is not only a book of salvation but also a book of healing [27]. That is, the Bible is also an eternal bibliotherapy material given by the God of healing (Jaehee Lee 2008). It is apparent from the fact that Jesus Christ himself became a counselor and performed an amazing healing ministry with the words of the Bible [28]. Accordingly, it is necessary to examine the scriptures used for the Christian bibliotherapy program, the number of times and subjects, and as a result, the key biblical verses used for the Christian bibliotherapy program was the Gospel of Luke, which was used the most for 5 times.

The words of Bible used for the Christian bibliotherapy program and the number of times they are used are as illustrated in <Table 17>.

Table 17. Words of Bible and frequency of use for the Christian bibliotherapy program.

Ranking	No. of selections	Verse
1	5	Luke 15:11-24
2	3	Genesis 22:9-18
2	3	Exodus 2:23-3:12
2	3	Samuel 1 and 2
2	3	John 4:1-9
2	3	2 Corinthians 6:4-10
2	3	Galatians 5:22-23
8	2	Genesis 41:41-45:15
8	2	Genesis 2:24-25
8	2	Luke 10:25-37
8	2	Ephesians 5:22-28

4. Discussion

The purpose of this study is to provide the basic data for the development of the Christian bibliotherapy research in the future by examining the research trends for the Christian bibliotherapy related dissertations in Korea targeting Christians from 2003 until 2022, and present the directions for the Christian bibliotherapy moving forward. Based on the results acquired from such, the discussion is presented as follows.

First, from 2003 to 2022, a total of 46 papers were published in the field of Christian bibliotherapy for Christians in Korea, including 35 dissertations and 11 papers in the Korean specialized journals. Furthermore, there are only 7 studies conducted from 2015 to 2022, which is a very minimal result compared to the number of general bibliotherapy studies, which suggests that the studies on the Christian bibliotherapy ought to be conducted in a variety of ways to ensure that the studies on the Christian bibliotherapy may be used even more actively. In particular, the Christian bibliotherapy offers the messages in the Bible, Christian books, and general books with therapeutic resources, which make the readers aware of the difficulties the protagonist is experiencing, thereby allowing them to vicariously gain satisfaction through immersion[10]. That is, the Christian bibliotherapy provides a therapeutic solution for the clients through the medium of book, which becomes an important research topic as a systematic and academic basis for the application process which provides support thereto, and plays an encouraging role as a method of Christian counseling. Accordingly, active studies ought to be conducted to ensure that the studies can proceed actively.

Second, the target of the Christian bibliotherapy study was primarily the middle-aged adults. In a study by Eunjoo Kang (2005) which claimed that the Christian bibliotherapy program was effective in restoring marital and family relationships, and a study by Sookyeong Kim (2006)[29] which claimed that the bibliotherapy program was effective in recovering from the broken hearts of married couples, the middle-aged adults were also studied[30]. However, the Christian bibliotherapy studies on the elderly have never been conducted. In this connection, Deokhee Lee and Minhwa Kim (2018) claimed that, with the increased life expectancy of the modern society, the interest in the health and welfare of the elderly is rapidly increasing, and the studies on the elderly are urgently needed in the future, and claimed that, accordingly, such studies ought help the practice and field of Christian bibliotherapy[17]. Hence, it is expected that the Christian bibliotherapy for the elderly will be carried out.

Third, the studies on the Christian bibliotherapy have primarily focused on the average households. This means that the Christian bibliotherapy can be easily used at the average households. However, since the Christian bibliotherapy also has a meaning to promote the spiritual growth, it is expected that the Christian bibliotherapy will increase its effectiveness by focusing on the religious institutions or religious leaders. To improve the quality of life of the religious people, it would sometimes be necessary to develop a program of religious activities through which they can participate continuously[4].

Fourth, as for the area of the Christian bibliotherapy, and as for the research topic according to the academic area, the emotional aspects were the most at 63.0%, followed by 'social aspects' and 'cognitive aspects,' respectively. Dasom Shin (2016) also claimed that most of the studies are biased in terms of the emotional aspects related to emotional changes[31].

Fifth, the studies of the Christian bibliotherapy were conducted around case studies the most, and those of the program development were the least. This is considered to be so because it is easier to study with literature than with practical studies using the program. However, since the Christian bibliotherapy can be actively used in the field when empirical research is conducted in a variety of ways, in order to activate the Christian bibliotherapy, an empirical analysis to develop various programs and validate their effects ought to be actively conducted.

Sixth, in the Christian bibliotherapy, the most number of books selected, or 10 times, was 1 picture book, and as for the books selected more than twice, the general books accounted for 20% of the total number of books used, while various types of books such as the Bible and picture books were broadly selected. In order to facilitate the Christian bibliotherapy program, it would be necessary to select high quality books across various fields and study them to ensure that they can be utilized for the bibliotherapy.

Seventh, the words of Bible used for the Christian bibliotherapy program turned out to be Luke, Genesis, Exodus, Samuel (first and second), John, 2 Corinthians, Galatians, Genesis, and Ephesians, which indicates the fact that the 9 books of the Bible primarily used were used, meaning that the Bible can be used for the Christian bibliotherapy. However, the Bible has 66 books in its entirety, and in order to be able to utilize all of them, an insightful understanding of the Bible and theological experiences are required. Hence, for the amicable progress of the Christian bibliotherapy using the Bible, it is proposed to conduct bibliotherapy at the level of churches and religious institutions based on what the theology the religious leaders have studied.

Gathering the results above, the significance and implications of this study are as follows.

It is meaningful in that this study has analyzed the research trends related to bibliotherapy from 2003 to 2022, and gathered and analyzed the relevant data for the past 20 years for the Christians, which is meaningful in that it has presented the directions for the studies of the Christian bibliotherapy along with the recent research trends. In the increasingly aging society, such methods as play therapy counseling programs are being proposed as a way to improve the mental and social health of the elderly, their quality of life, and reduce depression[32]. However, it takes much time to universalize them. and the cost is too high. On the other hand, bibliotherapy has a competitive edge in that it takes less time and cost relative to the play therapy, and hence, there is a great need to develop it. Above all, this study is meaningful in that it has accurately examined the current situation of the Christian bibliotherapy by analyzing the trends of the Christian bibliotherapy while the studies on the Christian bibliotherapy are very rare in Korea.

5. Conclusion and Recommendations

Based on the results of this study, how important the act of reading is for the humans and how it has led us to change and healing have been examined (Hyeeun Shin, 2018). Deokhee Lee and Minhwa Kim (2018) extracted a total of 470 papers with the topic of 'bibliotherapy' among the dissertations and the papers published in academic journals in Korea from 2008 until 2017. However, as examined in this study, the studies on the Christian bibliotherapy were very minimal with 46 papers over the 20 years at best. Such results mean that the studies on the detailed process of the Christian bibliotherapy are still inadequate. However, as examined earlier, the Christian bibliotherapy may be used as an effective counseling method to help the holistic personality development and problem solving through the trend research of this study. Hence, it is hoped that the Christian bibliotherapy will reflect the fast changing modern society, the studies by academic area will be gathered, and further in-depth studies through the connection with the Bible will be conducted.

Thus far, the Christian bibliotherapy studies have focused on the Christian counseling and theology. However, moving forward, it is expected that theories, program development, dissemination, and practice and research of Christian bibliotherapy as an auxiliary treatment for the facilitation of the Christian bibliotherapy across such areas as education, literature, and library and information science will be needed. The recommendations of this study towards this end are as follows.

Given the current situation where the Christian bibliotherapy studies in Korea have been limited to 1 instance of doctoral dissertation, it is expected that far more in-depth Christian bibliotherapy related studies will be needed to cover various psychological and emotional cultures at the level of doctoral degree, and the follow-up studies on the convergence relationship with surrounding studies will also be needed[10].

Second, considering the fact that there are no papers on the elderly at all, the development and dissemination of the Christian bibliotherapy programs related to the diseases of the elderly such as loss of family, depression and disease, cognitive decline and dementia for the elderly who are continuously increasing in the aging era, as well as follow-up studies will need to be conducted in line with the needs of the time.

Third, the results of this study have methodological limitations in that they have only presented the results of frequency and ratio analysis. It is hoped that the follow-up study will contribute to the development of the area of Christian bibliotherapy by presenting more specific directions for the Christian bibliotherapy related studies and practice based on the more thorough and detailed content analysis.

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7. Appendix

7.1. Authors contribution

Initial name	Contribution
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		-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"/>
Author	JH	-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"/>
		-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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A Case Study for the Protection of the South-North Tourism Agreement: Focusing on Tourism Feng Shui Storytelling

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Abstract

Purpose: This study seeks to present ways to realize tourism and unification for North and South Korea based on the development of tourist destinations which can help link tourism to exchanges including mutual visits for the separated families of North and South Korea, the North-South dialogue, politics, economy, culture and sports by developing tourist destinations from which politics of the two Korea are fully excluded towards the realization of multi purposed tourism as well as the realization of mutual tourism for the two Koreans absent South Korean tourists for North Korea. Based on which, it would be possible to review, first, the development of tourist destinations of South Korea through which South Koreans can visit Mt. Geumgang of North Korea and North Koreans can visit tourist destinations of South Korea. Second, it would be possible to review a plan for carrying out exchanges for the mutual visits of separated families by linking the exchanges of separated families of North and South Korea at Mt. Geumgang of North Korea with tourist destinations of South Korea. Third, by developing tourist destinations for the purposes of tourism only which North Korea might demand, it would be possible to review alternatives for North Korea's South Korean tourist destinations in the future. Fourth, based on the afore-said, the purpose of tourism and unification may be realized and tourist exchanges may be reviewed under the premise of free travel.

Methods: This study seeks to analyze changes in the tourism related conditions according to the expected changes in the North-South Korean relations and changes in tourism due to the expected changes of the North-South Korean relations via the previous data. Furthermore, through the current status of human exchanges of North Korea, the start of the North-South Korean tourism, and the performance achievements of Mt. Geumgang tourism, this study seeks to examine and understand the changes in the North-South Korean relations according to the North-South Korean summit and the tourism related feng shui storytelling intended for the North-South Korean tourism.

Results: Achieving a form of tourism through the North-South Korean exchanges is the top priority. Hence, in order to achieve the purpose of feng shui tourism in the future, it would be necessary to develop the tourist destinations from which politics of North and South Korea are completely excluded. Towards this end, it is necessary to develop a tourist program by utilizing the tomb of Kim Tae-Seo located at Mt. Moak in Jeonbuk in which the North Korean leadership expressed deep interest ever since the North-South Summit of 2000. To this end, it will be necessary to develop a program which utilizes the storytelling of tourist feng shui utilizing the simple Korean culture which goes beyond the politics, while developing tourism.

Conclusion: Tourism has clear points of contact for the unification, and it will be necessary to utilize the points of contact for the North-South Korean tourism through the mutual linkage of the North-South Korean relations moving forward to achieve the purpose of tourism and expect the unification on the Korean Peninsula.

[Keywords] North-South Korean Tourism, Agreement, Inter-Korean Relations, Feng Shui, Storytelling

1. Introduction

The first point of contact for the North-South Korean tourism was conceived by the visit to North Korea herding cattle by Chairman Jung Joo-young in June 1998. South Korea's tourism to North Korea, which began thereafter, reached approximately 2 million tourists in 11 years, focused on Mt. Kumgang, Kaesong, and Pyongyang. Furthermore, for the inter-Korean personal interchanges including tourism, 3,202,551 people from South Korea visited North Korea, and 8,354 people from North Korea visited South Korea, thereby accounting for 2% of the total, indicating an almost unilateral visit to North Korea by the South Koreans[1]. However, the start of such a point of contact for tourism led to the start of the Kaesong Industrial Complex and the inter-Korean summit, thereby forming the current mood for the unification of North and South Korea. This proves the accuracy of the logic which claimed that tourism provides the basis for unification[2]. In "Unification and Tourism Development," Professor Jangchun Lee summarized the basic directions for the North and South Korean tourism exchange and cooperation into 6 categories as follows.

First: The North-South Korean tourism exchange should be promoted in a direction which is mutually beneficial for both North and South Korea.

Second: The North-South Korean tourism exchange should not be made at the unilateral sacrifice of either side.

Third: The North-South Korean tourism exchange should be approached in a direction which can operate as a catalyst for promoting the unification of the Korean Peninsula.

Fourth: The North-South Korean tourism exchange should be approached in a way which can overcome all imbalances expected in the case of the North-South unification.

Fifth: The North-South Korean tourism exchange should adopt a gradual approach.

Sixth: There must be a prior institutional support for the North and South Korean tourism exchange and cooperation[3].

In order to approach tourism, it would be possible to classify tourism which is approached as a general tourism and a tourism systematically arranged from the perspective of tourism science. In terms of the tourism science, the classification according to the purpose of tourism is divided into the combined purpose tourism and the pure purpose tourism. The combined purpose tourism is a type of tour which is carried out for public or commercial purposes, which is a trip for the purposes of inspection, meeting, and attendance, etc., including official business trip, while the pure purpose tourism is a form of trip for the sole purpose of tourism, and is also a form of trip which is carried out relatively freely for personal recreation[4].

Tourism becomes the point of contact for unification, which may be possible only when the pure tourism which completely excludes the inter-Korean politics, mutual visits of separated families, inter-Korean talks, and dual purpose tourism which combines tourism in exchanges of political, economic, cultural, and sports differentiation are realized. Hence, this study has set the following research objectives in the attempt to develop the tourist destinations which completely exclude the political nature of the two Korea, and realize the combined purpose tourism by developing tourist destinations which can link tourism to exchanges such as the inter-Korean mutual visits, abduction talks, and exchanges in politics, economy, culture, and sports towards realizing tourism and unification.

This is set as the basis for realizing mutual tourism between North and South Korea in a state where South Korean tourists in North Korea are completely unlimited.

First, it is possible to review the development of the South Korean tourist destinations where South Koreans can visit Mt. Geumgang in North Korea while North Koreans can visit South Korean tourist destinations.

Second, it is possible to examine a plan for the mutual visits for the separated families by linking the current exchange of separated families between North and South Korea at Mt. Geumgang in North Korea with tourist destinations in South Korea.

Third, by developing the tourist destinations for the purposes of pure tourism which North Korea can demand, it is possible to review alternatives for North Korea's South Korean tourism destinations in the future.

Fourth, based on such, the purpose of tourism and unification may be realized and tourism exchanges can be reviewed on the premise of free travel and exchange.

2. Current Status Analysis

2.1. Changes in the tourism conditions according to the expectations of changes in the inter-Korean relations

The changes of the North and South Korean tourism have taken place according to the inter-Korean relations. With the inauguration of Kim Jong-il as Chairman of the National Defense Commission in 1998, North Korea advocated the military first politics as the central means of governing North Korea. The military first politics project the influence of the military across all aspects of the North Korean society, spanning from politics and economy to education, culture, and the arts, and continued until 2016 after the emergence of Kim Jong-un[5]. However, on July 11, 2008, at Mt. Geumgang, the tourist named Wangja Park was shot to death, at which point in time the tourism to Mt. Geumgang halted[6], and thereafter, the inter-Korean relations discontinued.

Tourism safety is a most important step toward protecting the body, life, and property of individual tourists, and is also a very important issue which can affect the image of a region or country and future tourism demand[7]. Such political changes suggest the possibility of the North and South Korean tourism. In the "September 19th Pyongyang Joint Declaration," the leaders of North and South Korea announced that they would promote the development of a tourism belt connecting Mt. Seorak, Mt. Geumgang, Mt. Wonsan, and Mt. Baekdu in the "Joint Special East Sea Tourism Zone"[8]. The 2018 inter-Korean summit, which was watched by all the people, would have been a good opportunity to form a consensus on unification, even if it is not an expert opinion[9].

The realization of the North and South Korean tourism is also an important variable for the political schedule of North and South Korea and the United States. The largest problem for the North and South Korean tourism in the future will be the resolution of the nuclear issue in the North Korea-U.S. relations and the lifting of sanctions on North Korea.

2.2. Forecast of tourism related changes according to the expected changes in the inter-Korean relations

As the changes in tourism conditions were examined given the expected changes in the inter-Korean relations, the changes in the North and South Korean tourism are expected to change depending on the ongoing US political situation, North Korea's nuclear issue, and the UN Security Council's sanctions against North Korea. Furthermore, the connection of the North-South Korea, China, and Russian railroads will be affected not only by the economic ripple effects, but also by political, diplomatic, and security factors with relevant countries. The North Korea's

railroad modernization will be significant in that it will contribute to laying the groundwork for the North Korea's economic growth, escaping isolation from the international community, easing tensions on the Korean Peninsula, preventing border disputes between China and Russia, promoting economic development, and lifting US sanctions[10]. First, if the current political situation in the United States is examined, after President Trump's Singapore summit, they need to create a favorable situation in the US midterm elections to be re-elected in 2020. Hence, the US is expected to actively engage in the dialogue with North Korea with the goal of re-election in 2020[11].

Second, North Korea's nuclear issue will be resolved sequentially together with the political situation of the United States. The denuclearization of North Korea and the guarantee of political, military, and economic stability for North Korea by the United States and the international community will be achieved simultaneously, on a phased in basis, and comprehensively according to the principle of equivalence.

Third, the UN Security Council's sanctions against North Korea cause important changes for the investment and development for tourist activities, etc. This is so since transportation and accommodations, which are the medium of tourism, must be accompanied by funds and logistics. Furthermore, tourist destinations, which are the object of tourism, will be developed. Examining the procedures of such sanctions, the phases of ① reinforcement, ② revision, ③ discontinuation, and ④ release will be undergone. Resolution No. 2397 (December 22, 2017) - UN Security Council S/RES/2397.

Fourth, tourism related conditions must be revised according to the political situation of the United States, North Korean nuclear issue, and the changes in the UN Security Council's sanctions against North Korea.

Given such an ambience, the North-South Korean Summit and exchanges across various fields including politics, economy, culture, sports, and tourism between the two Koreas will be carried out. In particular, along with the tourism of Mt. Halla which President Moon Jae-in proposed during the South Korea visit of Chairman Kim Jong-un, the tomb of Kim Tae-Seo, the progenitor of Chairman Kim Jong-un, which emerged in the media, will be an excellent point of contact for the tour program for such exchanges.

The tourism related point of contact presented in this paper is a form of tourism which might emerge during the North-South Korean Summit from 2018 to 2020 or human exchanges following the North-South Korean exchanges, which is consistent with the mutual purposes of North and South Korea. It is also a pure tourism which refers to the form of tourism which the top leaders of the two Koreas can present.

3. Analysis of the Point of Contact related Conditions for the North and South Korean Tourism

3.1. Personal interchange of North Korea

After the division of Korea, the personal interchange between North and South Korea began with the 1989 Inter-Korean Red Cross meeting. From 1989 to 2017, the total number of reunions was 20,644 people at the private level and at the government level.

Table 1. Status of reunions in North Korea.

Classification	1985-2017	Status of survivors (as of 2017)
Private level	3,416 people	Registered 131,143 people

Government level	17,228 people	Surviving 62,631 people
Total	20,644 people	Status of registration of the separated family information integrated system

Note: Ministry of unification (2018).

Table 2. Status of reunions in South Korea.

Classification	1985	2000	2001	Total
Cases	30 people	201 people	100 people	331 people
Personnel	81 people	1,720 people	899 people	2,700 people

Note: Ministry of unification (2018).

As for the overall status of the personal interchange of North and South Korea, the general personal interchange accounts for 41.6% and the tourism personal interchange accounts for 58.4%, with more than 50% of personal interchange accounting for tourism.

Table 3. Status of reunions in South Korea.

Classification	Personnel	Ratio (%)
General personal exchange related	1,461,911 people	41.6%
Tourism related personal exchange related personnel	2,048,994 people	58.4%
Total	3,510,905 people	-

Note: Monthly trends in the Inter-Korean exchange, Ministry of unification (2017).

3.2. Beginning of the point of contact for the North and South Korean tourism and Mt. Geumgang tourism

For the first time in 50 years since the division of North and South Korea, the point of contact for the North and South Korean tourism was attempted. On June 16, 1998, Chairman Jung Joo-young of Hyundai Engineering & Construction crossed Panmunjom and headed for North Korea with 500 cows in dozens of trucks at Seosan Farm in Chungcheongnam-do. This is the first case of Jung Joo-young's cattle visit to North Korea. During his first visit to North Korea, Chairman Jung stayed in North Korea for 8 days until June 23, and agreed with North Korea to promote the Mt. Kumgang tourism development project. After the 2nd visit to North Korea, the tour of Mt. Geumgang began, and on November 18, 1998, the vessel named 'Geumgang' sailed for the first time. The first inter-Korean summit was held since the division of Korea in June 2000, and in August of the same year, North and South Korea agreed to build the Kaesong Industrial Complex[12].

However, on July 11, 2008, tourism to Mt. Geumgang was temporarily discontinued since a tourist named Wangja Park was shot to death by the North Korean military[13]. For the proper cooperation in the disaster management system by and between North and South Korea to prevent recurrence in the inter-Korean exchanges, it is necessary to establish a disaster management and response system, beginning with such areas as border areas, economic cooperation areas, and exchange areas[14].

Table 4. Status of tourists visiting Mt. Geumgang·Gaeseong·Pyongyang: 1998-2008 (11 years).

Classification	Personnel
Mt. Geumgang tour	By Sea 555,998

	By Land	1,381,664
	Total	1,934,662
Gaesong tour	By land	112,033
Pyongyang tour	By plane	2,299

Note: Ministry of unification (2018).

The progress of the North and South Korean tourism has largely developed focused on the summit meeting. Geumgangsan/Gaesong/Pyongyang visits and the political situation and changes are as follows.

Table 5. Changes in the tourism and politics and economy and the changes of personal interchange.

Year		1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	Total
Mt. Geumgang tour	By Sea	10,554	148,074	213,009	57,879	84,727	38,306	448	-	-	-	-	552,998
	By Land	-	-	-	-	-	-	267,971	298,247	234,446	345,006	199,966	1,381,664
	Total	10,554	148,074	213,009	57,879	84,727	74,334	268,420	298,247	234,446	345,006	199,966	1,934,662
Gaesong tour		-	-	-	-	-	-	-	1,484	-	-	-	112,033
Pyongyang tour		-	-	-	-	-	1,019	-	1,280	-	-	-	2,299
-		Start of North Korea visit with cattle	-	The 1st Inter-Korean summit	-	-	Start of construction of Gaeseong Industrial Complex	-	-	-	The 2nd Inter-Korean summit	Discontinued	-

Note: Ministry of unification (2018).

Mt. Geumgang tour began on November 18, 1997, and tour discontinued after a tourist was shot to death at Mt. Geumgang on July 12, 2008.

4. Changes of the Inter-Korean relations and Taeseo Kim's Tomb in Mt. Moak

4.1. Since the 1st summit

Since the first inter-Korean summit, interest in the tomb of Taeseo Kim involved the June 15th Joint Declaration that 'Chairman Kim Jong-il will visit Seoul at an appropriate time' and the media's interest as to whether he will visit the tomb of Taeseo Kim, the founder of the family of Chairman Kim Jong-il, when he visits South Korea. After the first inter-Korean summit in 2000, relatively many articles about the tomb of Taeseo Kim were released by the media, and discussions of the tomb of Taeseo Kim, President Kim Il-sung, and Chairman Kim Jong-il, leading to the discovery of a famous place, were widely held by feng shui practitioners and the media.

In addition, the article published by the Seoul News on November 24, 2005, is as follows.

The family clan of Chairman Kim Jong-il originated in Jeonju. It has been said that he is the 33rd generation descendant of Kim Tae-Seo, Munjanggong and the progenitor. It was also said that, during the North and South Korean Summit in 2000, Chairman Kim told Heeho Lee, wife of President Kim Dae-jung (Lee clan of Jeonju) that, "At last, we have gathered as one family," and told the presidents of South Korean media and press visiting North Korea that, "I would like to pay my respect at the tomb of my progenitor if I visit South Korea".

4.2. Since the death of chairman Kim Jong-il

After the death of North Korean leader Kim Jong-il, who held the first inter-Korean summit since the division of Korea in November 2011, the media once again drew attention to the tomb of Taeseo Kim as he regretted not being able to visit South Korea.

On December 19, 2011, Newsis claimed that, "Chairman Kim met with DJ (President Kim Dae-jung) and said that he "wants to go visit the tomb of progenitor of his family in Jeonju. Approximately 50,000 close relatives of the Kim clan of Jeonju live in South Korea, and among the renowned include Jaesoon Kim, former Chairman of the National Assembly." It also reports on the sadness of Chairman Kim Jong-il for not being able to visit South Korea.

In an interview with Yonhap News on December 20, 2011, Professor Doogyu Kim clarified that, "In the article entitled "Feng Shui : Three Generations' Inheritance of the North Korean Political Power Seems Opaque," Professor Doogyu Kim of Woosuk University issued a conditional statement that whether the tomb located at Mt. Moak is the tomb of the progenitor of Kim Il-sung is not confirmed, and it would be impossible to verify the validity of the progenitor's tomb given the long elapse of time." Online version, Yonhap News, December 20, 2011.

According to the Unification News of North Korea, Kim Tae-Seo, the progenitor of the Kim clan of Jeonju, settled in Jeonju with his clan when the Gyeongju region was devastated due to the invasion of the Japanese forces in 1254, or the 41st year of King Gojong's reign, and died 3 years after their settlement, and was buried in Jeonju-gun, or Wanju-gun of present day."

4.3. Since the 2018 meeting between chairman Kim Jong-un and president Moon Jae-in

Kim Jong-un promised to visit Seoul this year. It was about realizing the dream that the ancestors of Kim Il-sung and Kim Jong-il could not achieve. When the inter-Korean summit is held in Seoul, Chairman Kim Jong-un would visit Mt. Moak. This is because the tomb of the founder of the Jeonju Kim clan is enshrined there[15].

On September 21, 2018, in an article of JoongAng Ilbo entitled, "Will Kim Jong-un Visit Mt. Moak where the progenitor of Kim Il-sung is at rest?", it was reported that, "When Kim Jong-il died in December 2011, the prediction prevailed that, "While the tomb of the progenitor of the Kim clan of Jeonju is a well known location, the bones of Kim Tae-Seo had already been extinguished, and so it would be difficult for the inheritance of 3 generations of Kim Il-sung to be materialized feng shui and geography wisely. Consequently, the prediction turned out to be incorrect as Kim Jong-un seized power."

5. Storytelling of Tourism Feng Shui for the Point of Contact for the North-South Korean Tourism

5.1. Storytelling of tourism feng shui

The three elements of tourism are classified into subject, object, and medium. The subject of tourism refers to the tourist who carries out tourism, while the object of tourism refers to the tourist destination which is the subject of tourism. Furthermore, accommodation facilities or transportation convenience facilities which connect the tourist, the main body of tourism, and the tourist destination for the smooth execution of tourism become the medium of tourism. Furthermore, the 3 elements of feng shui related geography are wind, water, and land.

Hence, it may be considered that tourism and feng shui are closely related. Therefore, the factors of feng shui and geography of such tourist destinations may be defined as tourism feng shui.

Furthermore, the tourism storytelling uses the important components of tourism storytelling, such as novelty, regional uniqueness, ease of explanation, authenticity, specificity, globality, interest, and sensibility, toward creating a story about tourist destinations and tell the tourists as a matter of marketing tool.

5.2. Storytelling of tourism feng shui in Mt. Moak for the point of contact for the North-South Korean tourism

5.2.1. Mt. Moak

Along with Giribong in Jeonju, Mt. Moak is showing off its figure like the bosom of graceful mother. Mt. Moak is a mountain which borders Gui-myeon, Jeonju-gun, Samcheon-dong, Jeonju, and Geumsan-myeon, Gimje-shi, while rising tall between Dongjin River and Mangyeong River, which are the main waters of the Honam Plain, and forming the Jeonju Innovation City and Provincial Government Office. Its shape is said to be just like the warm image of a mother holding her baby, and as such, it is called Mt. Moak[16][17][18].

Figure 1. Panoramic view of Mt. Moak.



Note: <https://cmail.daum.net>.

5.2.2. Naegimaengsaeng

At the top of Mt. Moak, Hwaseongchae of the Observation Deck, Toseongchae of the middle peak, and Hwaseongchae of Moak gather to form a magnificent peak, standing tall in the center of Jeonju, which looks like it embraces Jeonju. Its shape resembles Gochuksa from a distance as with Hwachae of both angles and Toseongchae of the center. It is presumed that the heliport was built on the top of Jungbong Peak with two large Hwaseongchae attached thereto, and hence, it must have been Samtaegae before.

5.2.3. Waegiseonghyeong

All the directions of the Samgilyuksoo which envelops hyeljang are matched by the beautiful sbyeok. Mt. Moak has the energy of mu from the direction of gyeongyu and as yangyang-deokeumdeok, yet the outer air which surrounds hyeol naturally has moonmugyeomjeon.

6. Conclusions and Suggestions

Examining the personal interchange between North and South Korea for tourism and reunification discussed earlier, it demonstrates the following characteristics.

First, the general personal interchange accounts for 41.6% and the tourism personal interchange accounts for 58.4%, indicating that over 50% of personal interchange is by tourism. Hence, in the meantime, the personal interchange has been made through tourism.

Second, if the Mt. Keumgang tourism and Kaesong tourism's Pyongyang Pavilion are gathered, the number of people who visited North Korea from South Korea was 3,202,551 people, and the number of people who visited South Korea from North Korea was 8,354 people, accounting for 2% of the total, which demonstrate a unilateral form of tourism by the South Koreans visiting North Korea.

Hence, it is most important to form tourism through the mutual exchange. Hence, in order to complete the purpose of tourism in the future, it is necessary to develop a tourist destination which completely excludes the inter-Korean politics.

Towards this end, it would be necessary to develop a tourist destination by using the tomb of Taeseo Kim in Mt. Moak and prepare a tourism program since the leader of North Korea demonstrated related interest. To this end, it is necessary to develop a program which utilizes the storytelling of tourism feng shui using the simple Korean culture that excludes politics, while the tourism development using such is necessary.

First, in order to make the currently unilateral tour of South Korea into the form of reciprocal visits, Mt. Moak in which the leader of North Korea holds interest should be developed with storytelling.

Second, in the future, the events for separated families must be held mutually in South Korea, and by utilizing Mt. Moak's tourist destination, combined tourism must be carried out.

Third, by storytelling Mt. Moak's tourist destination in which the leaders of North Korea held interest, it needs to be specialized as a tourist destination through tourism during the inter-Korean summit in South Korea, and attract the interest of North Korea and the world to revitalize the North and South Korean tourism.

Fourth, the government and private sector level exchanges such as politics, economy, culture, and sports, etc., or scholarly activities, followed by tourism, must promote tourism by creating the combined purpose tourism.

If such results above are derived, tourism will very likely provide the point of contact for the unification[19][20][21]. Unification is a good example as a systemic value for South Korea because the Constitution emphasizes the mission of peaceful unification based on the principles of freedom and democracy[22]. In the future, it is necessary to utilize the point of contact of the North-South Korean tourism through the mutual linkage of the inter-Korean relations to achieve the purpose of tourism and expect unification, and this is the point in time where the strategy of storytelling of tourism feng shui is needed towards that end.

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8. Appendix

8.1. Authors contribution

Initial name	Contribution

Author	YK	<ul style="list-style-type: none"> -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"/> -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"/> -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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Analysis of Male Semi-Permanent Makeup Image Types using Q-Methodology

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Abstract

Purpose: It can be said that the human desire to be beautiful has been with the history of mankind along with basic needs such as food, clothing and shelter. In Korean society, the social image of men's appearance is gradually opening up, and the beauty industry for men's semi-permanent makeup is gradually expanding. Therefore, what kind of image people have about men's semi-permanent makeup procedures was checked.

Method: In this study, type analysis was conducted using the Q-methodology. A Q-statement was composed through literature analysis and in-depth interview, and a 9-point scale Q-classification was performed by selecting a Q-sample and a P-sample and using the forced classification method. For factor analysis for type classification, principal component analysis was performed using the PC-QUANL program.

Results: As a result of the study, three types were derived. Type I was a 'genderless type' and showed an open attitude, thinking that there was no distinction between men and women in appearance care. Type II is a 'consideration type', showing a positive reaction to male appearance care and semi-permanent makeup procedures, and respecting personal preferences. Type III was a 'conservative thinking type' and had a negative and conservative reaction to male appearance care and semi-permanent makeup procedures.

Conclusion: This study explored the meaning of male and female semi-permanent makeup treatment images of various age groups using the Q-methodology. As a result of the study, an overall perspective on the image of men's semi-permanent makeup was confirmed. It is expected that it will be used as an in-depth and efficient data in future research on men's semi-permanent makeup.

[Keywords] Q-Methodology, Male, Semi-Permanent Makeup, Image, Classification

1. Introduction

Today's modern society is rapidly developing due to various socio-economic changes and the influence of media, which has improved the quality of life and increased public interest in appearance. Socially, interest in appearance management, which had been focused on women rather than men, came to the present day, and as men's consciousness changed, it became an important desire for all human beings without distinction between women and men [1][2]. Modern men are making efforts in various ways to form a good image of themselves and to form a successful social life and interpersonal relationship, and the awareness of appearance management has also been popularly expanded [3][4].

As a result of this change, the area of interest of men has expanded in Korean society, and interest in not only fashion but also makeup and beauty is increasing. Therefore, as the number of men seeking beauty increases, the male market related to appearance is rapidly growing [5][6]. Modern men are showing various appearance management behaviors to realize a stra-

tegic image with the recognition that their appearance is a competitive advantage and an important means for success[7][8]. The development of various media, such as beauty programs, YouTube, and SNS, amplified men's behavior and interest in appearance management, and is further subdivided due to the appearance of men's beauty YouTubers and influencers. Men with an active tendency are increasingly recognizing that it is an important element of self-expression and competitiveness through various appearance management actions ranging from makeup, skin care, semi-permanent makeup, and cosmetic surgery[9][10].

As life expectancy increases in Korean society, men who want to look healthy and young have a tendency to invest in their appearance, ranging from those in their 50s to 60s[11][12]. This phenomenon can be said that the social concept of men's image and appearance management itself has changed, men's emotional expression has been freed, and the viewpoint and standards for appearance management have changed regardless of gender. A neat appearance is recognized as a standard for self-management that gives a favorable impression to others. Therefore, it is acting as a positive factor in external work and business, and due to the influence of famous celebrities through the mass media, 'man wearing makeup' is no longer unfamiliar.

Recently, in the male cosmetics product area, functional products such as wrinkle improvement and whitening, as well as subdivided and specialized products such as BB cream, mascara for eyebrows, and mask packs used after shaving are released, expanding the demand base. It is also common to see men who apply BB cream before going out or adjust the shape of their eyebrows to add more.

Among the various methods that can change the appearance, men's semi-permanent makeup, which is relatively simple and allows for daily life immediately after the procedure, is gaining a lot of attention and is spreading to the public. Especially in the case of men, if the eyebrows are clear on the face, they can give a reliable look and impression. Therefore, the recognition of image expression through eyebrows is being shifted as an important part for men, who have difficulty in improving their image through makeup compared to women[13][14][15].

The Q-methodology used in this study is a method that actively utilizes human subjectivity, which was wary of during the scientific research process. The Q-methodology measures an individual's subjective opinion on a specific object or situational context, and it is possible to obtain data constructed through evaluation[16][17][18]. In this study, the types of male semi-permanent makeup images were categorized and the characteristics of each type were analyzed.

Through the results of this study, perceptions, preferred images, and opinions on the image of men's semi-permanent makeup were collected, and it is intended to be provided as basic data for the qualitative improvement of the semi-permanent makeup industry in the future.

2. Research Methods

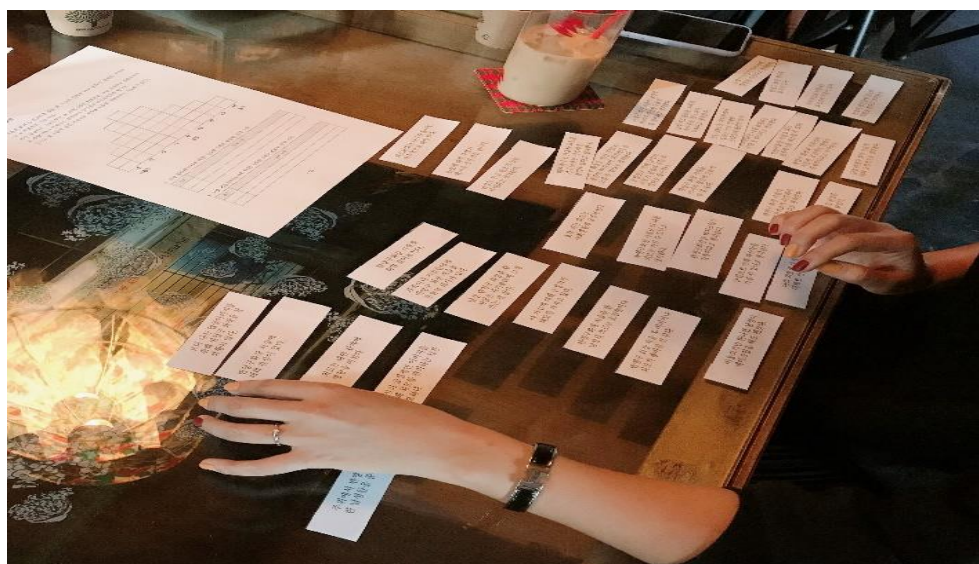
2.1. Composition of Q-population and selection of P-sample

This study was conducted on adult males and females in their 20s and 60s living in Seoul and Gyeonggi-do, Korea, and subjects were sampled by convenience sampling and judgmental sampling methods. The subjects for in-depth interview to establish the Q-population were randomly selected from a total of 7 people in their 30s, 2 in their 40s, and 1 in their 50s, who had experience with male semi-permanent makeup.

The P-sample consisted of 16 females and 16 males, and a total of 32 people were selected. The age of the subjects of the P sample was 6 in their 20s, 9 in their 30s, 6 in their 40s, 6 in their 50s, and 5 in their 60s, and males and females were selected in the same proportion. For the Q-statement, among the 87 statements made through in-depth interviews, items with overlapping

meanings were deleted, and after categorizing similar statements, 37 statements judged to have high discriminating power were finally extracted. This study was constructed through six steps: Q-population composition, Q-sample selection, P-sample selection, Q-classification, data processing and analysis, and type analysis. <Figure 1> shows the Q-classification process of study participants.

Figure 1. Q-statement classification process.



2.2. Data processing and analysis

To analyze the perceptions, experiences, and attitudes of men and women in their 20s to 60s toward the image of semi-permanent makeup for men, out of 32 people who were sampled as P-sample, data from a total of 31 people excluding data from one who had insufficient Q-classification and follow-up interview answers was analyzed using. Data were analyzed using the PC-QUNAL program, and the principal component factor analysis method was used for Q-factor analysis.

A total of three types were selected from the results calculated by inputting various factors based on an Eigen value of 1.0 or higher. This is because, in general, a person with a factor weight of 1.0 or higher has representativeness and can explain the characteristics of that type. In order for the uniqueness of each type to be recognized, it was selected considering that the explanatory variables were appropriate, and the standard scores were examined.

3. Research Results

3.1. Factor analysis result of P-sample

As a result of Q-factor analysis on the subjectivity of male semi-permanent makeup images, three types of subjectivity were found. Each type means that respondents' opinions describing differences and characteristics between groups are broadly classified into three categories. The explanatory power of the total variance indicated by type was 64%. Specifically, looking at the results of the analysis, Type I showed 26%, Type II, 20%, and Type III, 18% of explanatory power. <Table 1> shows the results of factor analysis by type.

Table 1. Factor analysis results by type of P-sample.

No	ID	Type I	Type II	Type III	Background variable		
					Gender	Age	experience
1	cos01	.2345	.3383	.1583	Male	38	yes
2	cos02	.3225	.8103*	.2111	Female	36	yes
3	cos03	.8112*	.3318	.2335	Female	36	no
4	cos04	.7127*	.3644	.3968	Female	33	yes
5	cos05	.1117	.1537	.0643	Female	37	yes
6	cos06	.8522*	.1310	-.0023	Female	28	yes
7	cos07	.3467	.6552*	.5543	Male	40	no
8	cos08	.7773*	.5204	.2111	Male	28	no
9	cos09	.1842	.0379	.7166*	Male	55	yes
10	cos10	.1536	.5421	.4368	Female	43	yes
11	cos11	.4511	.4004	.0755	Female	55	yes
12	cos12	.6401*	.4075	.3051	Male	40	no
13	cos13	.3754	.3308	.3738	Female	43	yes
14	cos14	.7964*	.4033	.1765	Female	26	yes
15	cos15	.7184*	-.0448	.0322	Female	25	no
16	cos16	.2466	.3738	.4632	Female	59	yes
17	cos17	.2515	.8617*	.1432	Male	39	yes
18	cos18	.2323	.3911	.2517	Male	41	no
19	cos19	-.0525	.3037	.7544*	Male	56	yes
20	cos20	.2669	.4143	.5734	Female	62	yes
21	cos21	.7302*	.5211	.4653	Female	40	yes
22	cos22	.4043	.7749*	-.0740	Female	36	yes
23	cos23	.2495	.4211	.5947	Female	67	yes
24	cos24	.1213	.1626	.8962*	Male	66	yes
25	cos25	.0475	.8011*	.0887	Male	24	no
26	cos26	.3149	.3281	.5863	Male	62	no
27	cos27	.2867	.0704	.3178	Male	57	yes
28	cos28	.8147*	.5513	-.0085	Male	27	yes
29	cos29	.4211	.7371*	.2423	Male	37	no
30	cos30	.3221	.3462	.3861	Male	34	yes
31	cos31	.5015	.4281	.6371*	Female	55	yes
% expl. Var		26	20	18			
cum% expl. Var		26	46	64			
Number of people		9	6	4			

Note: *p<0.05.

Since Type I has 26% of explanatory power, it can be seen as the type that explains the structure of subjectivity, such as perception and preference, regarding the image of the procedure perceived by adult men and women for semi-permanent make-up for men the most. As for the composition of subjects for each type, of the 31 P-samples, 9 were included in Type I, 6 in Type II, and 4 in Type III, indicating that a total of 19 people were included in the classification. Among

Type I, a 28-year-old woman (ID cos6) had the highest factor weight of .8522. Within each type, the higher the factor weight, the more typical and ideal people who can explain the characteristics of that type. When looking at the background variables of type II constructors, a 39-year-old male (ID cos17) had the highest factor weight of .8617, and in the case of type III, a 66-year-old male (ID cos24) had the highest factor weight of .8962. appear.

3.2. Correlation analysis between types

Correlation analysis was performed to find out the relationship between each type. The correlation coefficient presented in <Table 2> below shows the degree of similarity between each type. In the three types, the correlation coefficient of type 1 and type 2 is .3716, and type 1 and type 3 are .1814. It was found to show a positive (+) correlation. On the other hand, type 2 and type 3 are -.1241, indicating a negative (-) correlation.



Table 2. Results of correlation analysis between types.

Type	I	II	III
Type I	1	-	-
Type II	.3716	1	-
Type III	.1814	-.2241	1

3.3. Type I characteristic analysis: genderless type

A total of 9 subjects belonged to type I, 6 females and 3 males, and the ages were 5 in their 20s, 2 in their 30s, and 2 in their 40s. Occupations were found in the order of freelancer (professional), service industry, and student, and in the experience of semi-permanent makeup procedures, the proportion of experienced and inexperienced persons was similar.

Table 3. Q-Statements and awareness for type I.

Question	Q-statement	Z-value	Awareness
11	Regardless of gender, I believe that appearance management is an investment to build social confidence.	4	Strong positive  Positive
24	I think male appearance management is one of the means of expressing oneself.	4	
2	I think of men's semi-permanent makeup as a type of makeup.	3	
17	I think positively about semi-permanent makeup for men.	3	
33	Semi-permanent makeup treatment can relieve appearance complex.	3	Negative  Strong Negative
4	I often see men with semi-permanent make-up around them.	-3	
13	Semi-permanent makeup is necessary for a better facial image.	-3	
37	There is a need for constant expenditure on appearance care.	-3	
15	Men's semi-permanent make-up highlights the strengths and makes feel Satisfied.	-4	
22	Generally don't pay much attention to men's appearance management.	-4	

Regarding the presence or absence of people around who received semi-permanent make-up for men, 7 people answered 'Yes' and 2 people answered 'No'. <Table 3> above shows the statements and perceptions regarding genderless type of male semi-permanent makeup image..

3.4. Type II characteristic analysis: deliberation type

A total of 6 subjects belonged to type II, 2 females and 4 males, and the ages were 1 in 20s, 4 in 30s, and 1 in 40s. Occupations were freelance (professional), office workers, and students in that order. Regarding the experience of semi-permanent make-up, experienced and inexperienced persons had the same ratio, and the presence or absence of people around who had undergone semi-permanent make-up for men was also at the same rate. <Table 4> shows the statements and perceptions regarding the deliberation type of men's semi-permanent makeup image.

Table 4. Q-statements and awareness for type II.

Question	Q-statement	Z-value	Awareness
3	Semi-permanent make-up for men is a personal choice.	4	<div style="text-align: center;"> <div>Strong positive</div> <div>↑</div> <div>Positive</div> </div>
29	Taking care of your appearance for a positive image is a personal area.	4	
1	I am interested in semi-permanent makeup for men.	3	
26	Men's appearance management is a personal choice.	3	
28	Appealing appearance is positive for social life.	3	
5	I am interested in the style of male celebrities that I encounter in media such as TV and SNS.	-3	<div style="text-align: center;"> <div>Negative</div> <div>↓</div> <div>Strong Negative</div> </div>
6	It is overkill for men to care about the appearance of their eyebrows.	-3	
25	A man's appearance influences his interpersonal relationships.	-3	
9	It is difficult to say that the appearance of men is different because of the eyebrows.	-4	
20	I think that semi-permanent makeup is safe from a health and medical point of view.	-4	

3.5. Type III characteristics analysis: conservative thinking type

<Table 5> below shows the statements and perceptions regarding the image of semi-permanent makeup for men of the conservative thinking type.

Table 5. Q-statements and awareness for type III.

Question	Q-statement	Z-value	Awareness
18	Semi-permanent make-up does not help men to change their image.	4	<div style="text-align: center;"> <div>Strong positive</div> <div>↑</div> <div>Positive</div> </div>
34	Semi-permanent makeup is the domain of women.	4	
6	It is overkill for men to care about the appearance of their eyebrows.	3	
12	Semi-permanent makeup treatment does not help much to improve the image.	3	
31	It is not easy to evaluate a man's appearance with one semi-permanent makeup procedure.	3	

21	I think that the sustainability of semi-permanent makeup is economical in terms of time and money.	-3	Negative ↓ Strong Negative
23	Semi-permanent makeup can have a positive attitude toward appearance management.	-3	
27	Men should also pay attention to the evaluation of those around them about their appearance.	-3	
11	Regardless of gender, I believe that appearance management is an investment to build social confidence.	-4	
13	Semi-permanent makeup is necessary for a better facial image.	-4	

A total of 4 subjects belonged to type III, 1 female and 3 males, and the ages were 3 in their 50s and 1 in their 60s. Occupations were self-employment and service industry in that order, and all participants had experience of semi-permanent makeup. Among those who received semi-permanent make-up for men, 3 people answered 'yes' and 1 person answered 'no'.

4. Conclusion and Recommendations

Semi-permanent makeup is being developed independently from the general makeup field for convenience in terms of beauty, money, and time saving for modern people. Demand is also increasing significantly in Korea, thanks to the trend of the beauty industry, which is developing regardless of gender[19][20][21]. Therefore, this study conducted a Q-methodology to find out the subjective perception of the image of men's semi-permanent makeup procedures in Korea, which is developing as another culture, and classified three types of recognition through this.

Type I was a 'genderless type', and showed a characteristic of taking an open attitude toward men's appearance management, thinking that there was no distinction between men and women in appearance management. Semi-permanent makeup treatment was also considered as a part of appearance management, and they thought positively regardless of gender. In other words, they showed an overall open attitude in accepting men's semi-permanent makeup.

Type II was 'Deliberation', which was a positive reaction to male appearance management and semi-permanent makeup, and a position to respect individual preferences. In other words, men showed a passive and cautious attitude that they should carefully wear semi-permanent makeup in consideration of various factors.

Type III was a 'conservative thinking type' and showed negative reactions to male appearance management and semi-permanent makeup. The image of semi-permanent makeup for men was found to have opinions such as 'excessive', 'awkward', 'burdened', and 'there is a risky element.'

In Korea, in the past, there was a perception that appearance management was the exclusive domain of women, but recently the social concept of men's appearance and image itself has changed. According to the change of modern society that is diversified and individualized, the standards for looking at men's appearance management have changed, men's emotional expression has become more free, and stereo types about masculinity are disappearing. As a result, a socio-cultural concept was formed that men's perception of their appearance could be developed into a better state when they were cared for and cared for like women[22][23][24].

In a follow-up study, if the subject is broadly expanded to not only men but also women, it will be possible to find out what the differences in the images of semi-permanent make-up are for men and women. In addition, if the subject of the study is divided into those who have experienced male semi-permanent makeup and those who have not experienced it, if a subjectivity study is attempted, the results of the study between the two groups can be compared and analyzed. The results of this study are meaningful in that they were able to check the overall

perspective by exploring the subjective meaning of men's semi-permanent makeup images and understanding various perceptions.

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6. Appendix

6.1. Authors contribution

	Initial name	Contribution
Lead Author	YS	-Set of concepts <input checked="" type="checkbox"/> -Design <input checked="" type="checkbox"/> -Getting results <input checked="" type="checkbox"/> -Analysis <input checked="" type="checkbox"/>
Corresponding Author*	JL	-Make a significant contribution to collection <input checked="" type="checkbox"/> -Final approval of the paper <input checked="" type="checkbox"/> -Corresponding <input checked="" type="checkbox"/> -Play a decisive role in modification <input checked="" type="checkbox"/>
Co-Author	HW MP	-Significant contributions to concepts, designs, practices, analysis and interpretation of data <input checked="" type="checkbox"/> -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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The Impact of the Fans' Sympathetic Understanding of Sports Stars on the Attractiveness and Emotional Reaction

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Abstract

Purpose: The purpose of this study is to examine and understand the effect of sympathetic understanding of fans on the attractiveness and emotional reaction of sports stars, which not only has a significant national or social impact, but also significantly influences the fans' purchase or intention of purchase of sports related products. Furthermore, it is to help to form a relationship with the fans, and also helps the clubs or teams improve their image using sports stars and establish marketing strategies.

Method: In this study, 290 professional sports fans as of 2022 were surveyed, and the convenience sampling was used for the sampling method, and the survey was conducted using the Self-Administration Method. Among the collected questionnaires, 281 questionnaires were used as valid samples, excluding the data with insincere responses or omission of some of the contents of the survey. The measurement tool is a questionnaire, and the data processing was carried out using the SPSS 24.0 Program, a statistical package program, and frequency analysis, reliability verification, factor analysis, correlation analysis, and multiple regression were performed.

Results: In this study, as a result of factor analysis and reliability verification performed, the sympathetic understanding consisted of two factors, cognitive factor $\alpha=.883$ and emotional factor $\alpha=.836$. The attractiveness was consisted of three factors, and it turned out to be a friendliness factor $\alpha=.867$, an intimacy factor $\alpha=.851$, and a similarity factor $\alpha=.799$. The emotional reaction consisted of two factors, positive factor $\alpha=.855$ and negative factor $\alpha=.830$. According to the method and process used in the study, the overall result is that the fans' sympathetic understanding of sports stars affects the attractiveness and emotional reaction.

Conclusion: In this study, the fans' sympathetic understanding of sports stars influences attractiveness and emotional reaction, and in sports clubs or teams, players' performances, including signing players, and the players' personal or social activities can win sympathy from their fans, and it requires much effort for a long period of time to win such kind of sympathy, and the most basic thing is a sincere activity. If these sincere activities are continued, naturally, the fans feelings towards the club or players will change positively, and that change will lead to purchase of sports related products or a change in positive attitudes related to it.

[Keywords] Sports, Sports Stars, Sympathetic Understanding, Attractiveness, Emotional Reaction

1. Introduction

1.1. Need for research

Numerous sports fans feel attached to a particular team and experience empathy, such as enthusiasm or disappointment, by immersing themselves in the process of consuming the team's game, as if it was their own victory or defeat, depending on the result of the team's game. One of the matters which affects the people's enthusiasm for and empathy for specific sports stars is the content provided by sports related clubs or sports stars. Through this, one feels happiness and despair[1], and recently, the activities of clubs and players using media or

the SNS are increasing throughout the sports field, including professional sports, and these activities are universally established. These clubs' and players' activities using the SNS are very helpful in forming relationships with fans, and humans have a desire to form social networks and interact with other people. In order to address the psychological deficiency, they experience continuous and daily substitute socialization with specific clubs or sports stars through participation in the mass media or fan community[2]. Accordingly, people try to form various types of interactive relationships through these para-social interactions, overcome psychological instability, and compensate for their innate deficiencies[3]. In that process, consumers feel an emotional bond with a specific star and empathize with the star's situation, are enthusiastic or frustrated with the content produced by the star, and feel a sense of happiness in the content consumption process. These star brand consumption behaviors of consumers are a process of expanding the pursuit of pleasure, and through content purchase and consumption, consumers have enjoyment and pleasure, as well as sensual and aesthetic experiences[4][5].

That is, the role of sports stars, that is, interest and enhancement of fans or the public, means that the aspect of mass media plays a role, and as an information delivery medium possessed by the mass media itself, sports are very attractive products, and its influence is expected to increase significantly in the future[6]. This means that media sports audiences have an increasing opportunity to access sports related information through mass media such as TV, newspaper, Internet, and SNS. In this information age, mass media such as the Internet and SNS may become the primary environment. The influence of media on humans plays a very important role[7]. In particular, the mass media gives the public interest in sports, sympathetic understanding, and attraction to star players, and further changes the perception and attitude toward clubs and players, and accordingly, athletes have received a lot of attention[8].

Hence, the purpose of this study is to determine the effect of the fans' sympathetic understanding of sports stars on attractiveness and emotional reaction, which not only has a great national or social impact, but also significantly influences the fans' purchase or intention of sports related products, and also help the club or team to improve their image or establish a marketing strategy using sports stars as well as helping them form relationships with the fans of sports stars.

1.2. Hypotheses of the research

The purpose of this study is to examine and understand the effect of the fans' sympathetic understanding of the sports stars on attractiveness and emotional reaction. Sympathetic understanding was claimed to have an effect on authenticity in emotional relationships[9][10], and it turned out that there was a relationship between sympathetic interest, sympathetic response, and sympathetic understanding[11], and the ability to understand empathy was related to psychological acceptance. turned out to exist[12]. Attractiveness turned out to be related to attachment, an emotional reaction[13], and attractiveness turned out to affect the behavioral intention[14]. Attractiveness turned out to have an effect on the class satisfaction and the intention to continue exercising, and the attractiveness turned out to affect the intention to maintain relationship and intention to purchase[15][16].

Hence, in this study, as it may be seen that there is a relationship between sympathetic understanding, attractiveness, and emotional reaction from the results of previous studies, the following hypotheses were established based on the results.

Hypothesis 1. Sympathetic understanding will have a significant effect on attractiveness.

Hypothesis 2. Sympathetic understanding will have a significant effect on emotional reaction.

Hypothesis 3. attractiveness will have a significant effect on emotional reaction.

2. Research Methods

2.1. Subjects and sampling technique

In this study, as of 2022, 290 professional sports fans were surveyed and the convenience sampling method was used for the sampling method, and the survey was conducted using the self-administration method. Among the collected questionnaires, 281 questionnaires were used as valid samples, excluding the data with insincere responses or omission of some of the contents of the survey.

Table 1. General characteristics of the study subjects.

Variable	Classification	N
Gender	Men	178
	Women	103
Age	Teen	52
	20s	99
	30s	74
	40s	39
	50s or older	17
Preferred sports	Professional baseball	111
	Professional soccer	94
	Professional volleyball	46
	Professional basketball	30

2.2. Measuring instrument

The measuring tool used in this study is a questionnaire, and the detailed questionnaire's structure is as follows.

First, for the sympathetic understanding factor, the questionnaire used in the study of Misook Choi (2006), Yunjin Son and Surim Lee (2019), and Myunghwa Jung and Jeongsoon Hong (2018) was modified and supplemented to be in line with the purpose of this study, and the questionnaire was consisted of questions on emotional empathy[17][18][19].

Second, the attractiveness factor is the questionnaire used in the study of Beomjin Kim and Hoseok Ko(2019), Inpyeong Ryu, Chunghwa Jung, Jindong Son(2018), Seongdeok Kim and Gyeyoung Lee(2019), and Suyeon Noh(2016), and it was supplemented and used, and the questionnaire was consisted of the questions on similarity, intimacy, and friendliness[20][21][22][23].

Third, emotional reaction factors were determined by using the questionnaire used in the study of Jeonghak Lee, Yunkyung Hwang, Seungjae Yim (2021), Inseon Hwang and Sangil Lee (2021), Sungkyu Jo and Kyuhwan Choi (2020), Jitae Kim, Youngin Won, and Youngjun Kim (2018) for the purposes of this study, and they were modified and supplemented to suit the use, and the questionnaire consisted of positive and negative questions[24][25][26][27].

Table 2. Structure of the questionnaire.

Classification		Details of structure	No. of questions
Background variable	General characteristics	Gender, age, and preferred sports	3

Independent variable	Sympathetic understanding	Cognitive empathy and emotional empathy	8
Mediator variable	Attractiveness	Similarity, intimacy, and friendliness	10
Dependent variable	Emotional reaction	Positive emotional reaction and negative emotional reaction	8
Total number of questions			29

2.3. Analysis of data

The data processing in this study was carried out by the SPSS 24.0 Program, a statistical package program, and statistical verification was performed as follows according to the purpose of data analysis.

First, frequency analysis was performed to identify the general characteristics of the subjects.

Second, the Cronbach's α coefficient was calculated to verify the reliability of the questionnaire, which is the measurement tool of this study, and .6 or higher was selected as the reliability criterion.

Third, factor analysis was performed to classify the factors of sympathetic understanding, attractiveness, and emotional reaction.

Fourth, correlation analysis was performed to examine and understand the conventions between each variable and to determine whether multiple regression analysis, an actual statistical method, was used.

Fifth, multiple regression was used to examine and understand the effect of sympathetic understanding on attractiveness and emotional reaction, and the significance level was .05.

3. Results

3.1. Validity and reliability of the questionnaire

In this study, factor analysis was performed to examine the factors forming the variable. The principal component analysis (PCA), which emphasizes the mutual independence of factors, was used during factor analysis, and the orthogonal rotation Varimax method was used for factor rotation. For the factor extraction, only the factors with an eigenvalue of 1.0 or higher were selected, and the factor loading indicating the degree of correlation between each variable and factor was limited to only the questions with an eigenvalue of 0.5 or higher. Reliability was calculated as Cronbach's α coefficient, which provides the reliability of all variables for a single concept.

<Table 3> shows that the factor analysis and reliability verification for sympathetic understanding were classified into the cognitive factors and affective factors. The eigenvalues and reliability of cognitive factors were 5.219 ($\alpha=.883$), and affective factors 4.513 ($\alpha=.836$).), and the ratio of two factors explaining all variables turned out to be 55.989%, respectively.

As a result of factor analysis and reliability verification for attractiveness in <Table 4>, it was classified into friendliness factor, affinity factor, and similarity factor, and the eigenvalue and reliability of the favorable factor turned out to be 3.465 ($\alpha=.867$), affinity factor 3.114 ($\alpha=.851$), and the similarity factor 2.802 ($\alpha=.799$), and the ratio of the three factors explaining the overall variable turned out to be 69.265%, respectively.

As a result of the factor analysis and reliability verification for emotional reaction in <Table 5>, the positive factors and negative factors were classified into the positive factors and the

eigenvalues and reliability of positive factors were 3.942 ($\alpha=.855$) and 3.455 ($\alpha=.830$) negative factors, and the ratio of two factors explaining the total variable turned out to be 62.654%, respectively.

Table 3. Factor analysis and reliability of the sympathetic understanding.

Question	Cognitive	Emotional
Q. Identification of key issues	.876	.052
Q. Expression of thoughts	.771	.116
Q. Help for understanding players	.709	.186
Q. Help for troubleshooting	.692	.023
Q. Encouragement for finding the cause of problem	.660	.124
Q. Encouragement	.141	.827
Q. While lie	.174	.776
Q. Efforts to understand	.310	.725
Eigen value	5.219	4.513
Pct of var	35.176	20.813
Cum pct	35.176	55.989
Cronbach's α	.883	.836

Table 4. Factor analysis and reliability of the attractiveness.

Question	Friendliness	Intimacy	Similarity
Q. Sophisticated	.834	.354	.112
Q. Attractive	.799	.188	.337
Q. Fond of looks	.732	.394	.071
Q. Activeness	.707	.414	.101
Q. Intimacy	.326	.865	.238
Q. Feels like a friend	.237	.814	.224
Q. Comfort	.255	.786	.347
Q. Similar way of thinking	.201	.257	.871
Q. Similarity	.226	.192	.822
Q. Similar lifestyle	.147	.321	.763
Eigen value	3.465	3.114	2.802
Pct of var	27.842	22.198	19.225
Cum pct	27.842	50.040	69.265
Cronbach's α	.867	.851	.799

Table 5. Factor analysis and reliability of the emotional reaction.

Question	Positive	Negative
Q. Comfort	.902	-.325
Q. Satisfaction	.851	-.266
Q. Pride	.818	-.397
Q. Confidence	.790	-.204
Q. Intimacy	.763	-.412
Q. Regret	-.277	.875

Q. Disappointment	-.312	.841
Q. Unpleasantness	-.276	.820
Q. Tediousness	-.345	.768
Eigen value	3.942	3.455
Pct of var	33.176	29.478
Cum pct	33.176	62.654
Cronbach's α	.855	.830

Table 6. Correlation analysis.

	Cognitive	Emotional	Friendliness	Intimacy	Similarity	Positive	Negative
Cognitive	-						
Emotional	.328**	-					
Friendliness	.569**	.357***	-				
Intimacy	.578**	.289***	.588***	-			
Similarity	.466**	.275**	.530**	.657**	-		
Positive	.635**	.295**	.684**	.753**	.531**	-	
Negative	-.471**	-.194**	-.609**	-.576**	-.312**	-.644**	-

Note: *** $p < .001$ ** $p < .01$.

<Table 6> shows the results of correlation analysis using the SPSS, and determining from the fact that the relationship between all the constituent concepts is positive (+) or negative (-), the direction of the relationship between the variables suggested by the research hypothesis is consistent, and based on such results, in this study, the use of multiple regression may be appropriately used to examine and understand the effect of sympathetic understanding on attractiveness and emotional response.

3.2. The effect of sympathetic understanding on attractiveness

Table 7. The effect of sympathetic understanding on sympathy.

Independent variable	Dependent variable	Non-standardized coefficient		Standardized coefficient β	t	R^2	F
		<i>b</i>	<i>Std.E</i>				
Cognitive	Friendliness	.516	.068	.535	9.838***	.367	62.784***
Emotional		.384	.060	.368	5.361**		

Note: *** $p < .001$ ** $p < .01$.

<Table 7> shows the fact that cognitive and emotional factors of sympathetic understanding have a significant effect on friendliness, and the coefficient of determination $R^2 = .367$, with an explanatory power of 36.7%.

Table 8. The effect of sympathetic understanding on intimacy.

Independent variable	Dependent variable	Non-standardized coefficient		Standardized coefficient β	t	R^2	F
		<i>b</i>	<i>Std.E</i>				
Cognitive	Intimacy	.450	.077	.468	8.348***	.359	59.938***
Emotional		.335	.067	.356	4.389**		

Note: *** $p < .001$ ** $p < .01$.

<Table 8> shows that the cognitive and emotional factors of sympathetic understanding have a significant effect on intimacy, and the coefficient of determination $R^2=.359$, with an explanatory power of 35.9%.

Table 9. The effect of sympathetic understanding on similarity.

Independent variable	Dependent variable	Non-standardized coefficient		Standardized coefficient	t	R^2	F
		<i>b</i>	<i>Std.E</i>	β			
Cognitive	Similarity	.631	.067	.534	11.457***	.298	78.254***
Emotional		.485	.059	.419	8.436***		

Note: *** $p<.001$ ** $p<.01$.

<Table 9> shows that the cognitive and emotional factors of sympathetic understanding have a significant effect on the similarity, with the coefficient of determination $R^2=.298$, with an explanatory power of 29.8%.

3.3. The effect of sympathetic understanding on emotional reaction

Table 10. The effect of sympathetic understanding on positivity.

Independent variable	Dependent variable	Non-standardized coefficient		Standardized coefficient	t	R^2	F
		<i>b</i>	<i>Std.E</i>	β			
Cognitive	Positive	.754	.064	.596	10.469***	.458	90.176***
Emotional		.552	.057	.485	8.216**		

Note: *** $p<.001$ ** $p<.01$.

<Table 10> shows that the cognitive and emotional factors of sympathetic understanding have a significant positive effect, with the coefficient of determination $R^2=.458$, with an explanatory power of 45.8%.

Table 11. The effect of sympathetic understanding on negativity.

Independent variable	Dependent variable	Non-standardized coefficient		Standardized coefficient	t	R^2	F
		<i>b</i>	<i>Std.E</i>	β			
Cognitive	Negative	-.602	.066	-.435	-7.245**	.311	58.384***
Emotional		-.047	.062	-.039	-2.589*		

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

<Table 11> shows that the cognitive and emotional factors of sympathetic understanding have a significant effect on the negative, and the coefficient of determination $R^2=.311$, with an explanatory power of 31.1%.

3.4. The effect of attractiveness on emotional reaction

Table 12. The effect of attractiveness on positivity.

Independent variable	Dependent variable	Non-standardized coefficient		Standardized coefficient	t	R^2	F
		<i>b</i>	<i>Std.E</i>	β			
Friendliness	Positive	.453	.049	.447	9.543***	.403	69.418***
Intimacy		.481	.043	.435	8.305***		
Similarity		.352	.032	.356	5.371*		

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

<Table 12> shows that the friendliness factor, intimacy factor, and similarity factor of attractiveness have a significant positive effect on the positive, and the coefficient of determination $R^2=.403$, with an explanatory power of 40.3%.

Table 13. The effect of attractiveness on positivity.

Independent variable	Dependent variable	Non-standardized coefficient		Standardized coefficient	t	R ²	F
		<i>b</i>	<i>Std.E</i>	<i>β</i>			
Friendliness	Positive	-.516	.060	-.516	-9.518***	.305	56.284***
Intimacy		-.461	.062	-.365	-6.127**		
Similarity		-.289	.054	-.294	-4.580*		

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

<Table 13> shows that the friendliness factor, intimacy factor, and similarity factor of attractiveness have a significant effect on the negative, and the coefficient of determination $R^2=.305$, with an explanatory power of 30.5%.

4. Discussion

In this study, it turned out that sympathetic understanding of fans about the sports stars affects the attractiveness and emotional reaction. In connection with the results of this study, it turned out that the player image had a significant effect on the loyalty and intention to purchase. Regarding the relevant reason, it was claimed that advertisements featuring sports stars have the strength to secure a wide and diverse age group, not a specific age group, and this can have a positive effect on the company, club, and brand loyalty[28]. Sports are combined with local tourism and cultural products to revitalize the economy itself and affect regional development. Sports consumption not only provides satisfaction through entertainment or emotions provided by sports itself, but also brings various satisfaction through support for athletes, which also brings satisfaction through consumption of various emotions[29]. Given the influence of sports, numerous companies today are using sports or sports stars to emphasize the need to enhance corporate image and activate marketing while developing sports marketing strategies, because various positive effects may be obtained[30]. Recently, the clubs' or sports stars' activities in mass media and various social media have a positive effect as great as the effect of appearing in advertisements, which may have a negative effect on the reaction, and hence, it is an important time to establish the players' social and moral attitude.

Advertising using sports stars has a correlation between the product attributes that a company seeks to pursue and the attributes of sports stars, and rising sports stars advertising model image affects product sales. not only can increase brand attitude, image, and loyalty, but also appearance has an important influence not only on celebrities or service workers, but also on job seekers, interpersonal relationships, and changes in the social status[31][32][33][34]. The sports stars' image in sports advertisements is considered to have a very important effect on the intention to purchase product, and hence, when a company advertises sports, it has a positive effect on not only the corporate image but also the consumers' intention to purchase products by marketing the sports stars' image suitable for the product, which needs to be carried out to ensure that it can have an impact on the people[35].

The companies or clubs which conduct marketing activities by utilizing sports stars as well as the individuals should first make efforts to improve performance and performance, which is the most important thing as a player. Only if it is carried out to the extent possible can the fans become attracted to the players and increase their loyalty to the club or team, as well as affect the change of sports attitude as a positive emotional reaction toward them. Customer attitude

is a kind of relatively stable internal psychological state which consumers have towards a certain product or service, and in general, the more active a consumer's attitude is, the greater the likelihood of using a product or service[36]. Hence, for the sports stars or clubs, specific performances and records related to sports stars should be periodically exposed to the media to increase their evaluative image, so that attitudes, images, and loyalty toward players or clubs may be increased, and the value of the club through sports stars. In order to increase the effectiveness of advertising and advertising, it is necessary to create various events that fans can enjoy with the sports stars they prefer, or continuously hold events to form a consensus on the sports stars.

5. Conclusion

The purpose of this study is to examine and understand the effect of the fans' sympathetic understanding of sports stars on attractiveness and emotional reaction, which not only has a great national or social impact, but also significantly influences the fans' purchase or intention of sports related products, and will also help them learn and help form relationships with the fans of sports stars, as well as help the clubs or teams improve their image or establish marketing strategies utilizing the sports stars.

The subjects of this study were 290 professional sports fans as of 2022 as of 2022. The convenience sampling was used for the sampling method, and the survey was conducted by using the Self-Administration Method. Among the collected questionnaires, 281 questionnaires were used as valid samples, excluding the data with insincere responses or omission of some of the contents of the survey.

The measuring tool was a questionnaire, and for data processing, frequency analysis was performed to identify the general characteristics of the study subjects using the statistical package program SPSS 24.0 Program, and to verify the reliability of the questionnaire, the measuring tool of this study, the α coefficient was calculated. The factor analysis was performed to classify sympathetic understanding factors, attractiveness factors, and emotional reaction factors. Correlation analysis was performed to examine the convention between each variable, and multiple regression was used to examine the effect of sympathetic understanding on attractiveness and emotional reaction, and the significance level was .05.

The conclusions secured through such research methods and processes are as follows.

First, sympathetic understanding (cognitive and emotional) affects attractiveness (friendliness, intimacy, and similarity).

Second, sympathetic understanding (cognitive and emotional) influences emotional reaction (positive and negative).

Third, attractiveness (friendliness, intimacy, similarity) affects emotional reactions (positive, negative).

Hence, it is apparent that the fans' sympathetic understanding of sports stars affects their attractiveness and emotional reaction, and the sports clubs and teams show sympathy for the fans in terms of their performances, personal and social activities, including the signing of players. In order to win such kind of sympathy, it requires much effort for a long period of time, and the most basic matter may be claimed to be a sincere activity, and if such sincere activities are continued, naturally, the fans feelings towards the club or players will change positively, and such change will lead to the purchase of sports related products or a change in their positive attitudes related to it.

6. References

6.1. Journal articles

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7. Appendix

7.1. Authors contribution

	Initial name	Contribution
Lead Author	HC	-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*	BC	-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	SJ	-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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