

# Short and Long-Time Cosmetic Therapy Promotes Automatic Nervous System and Mood of Elders

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**How to cite this paper:** Ando, M. (2026). Short and Long-Time Cosmetic Therapy Promotes Automatic Nervous System and Mood of Elders. *Psychology*, 17, 577-584. <https://doi.org/10.4236/psych.2026.175029>

**Received:** April 5, 2026  
**Accepted:** May 22, 2026  
**Published:** May 25, 2026

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## Abstract

**Background:** There is some evidence about effects of cosmetic therapy from aspects of physiology like brain. However, there are few studies from both automatic nervous system and psychology, and we needed evidence from this aspect. **Purpose:** The purpose of this study was to obtain evidence of cosmetic therapy in the short and long term on automatic nervous system and psychology of elders. **Method:** The design of this study was a single arm pre/post pilot study. Participants were healthy elders who could move for themselves and communicate with others. In experiment 1, 14 healthy elders received cosmetic therapy once and a researcher measured automatic nervous systems by an instrument pre and post (short-term). It measured LF (Low Frequency: sympathetic nerve), HF (High frequency: parasympathetic nerve), and LF/HF (balance of LF and HF). LF/HF high score shows high activity and well-being. We used this indication. In experiment 2, the same elders received cosmetic therapy as second session after a week (long term) and completed the Profile of Mood Scale 2 (MOMS 2) and questions about impression for cosmetic therapy in “Motivation”, “Waking up”, “Comfort”, and “Vigor” by 10 Likert scale. **Results:** In Experiment 1, there was significant difference between pre and post about LF/HF ( $p < .01$ ). In experiment 2, there was also significant difference between pre and post about LF/HF ( $p < .05$ ). As for POMS, Tension and Anxiety significantly decreased, and Total Mood Disturbance (TMD) also significantly decreased after cosmetic therapy. Scores of impressions about “Motivation”, “Waking up”, “Comfort”, and “Vigor” were over 7.0 point in 10 full score. **Conclusion:** These results suggest that both short and long term cosmetic therapy affected automatic nervous system. And cosmetic therapy particularly affected tension-anxiety and total mood disturbance. Impression for cosmetic therapy was high. Cosmetic therapy may be useful for elders in both automatic nervous system and psychological aspect.

## Keywords

Cosmetic Therapy, Elders, Automatic Nervous System, Psychology, Short and Long Term

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## 1. Introduction

The number of elderly people has been increasing every year, and the number of elderly people with dementia is also increasing. Aging or well-being of elders is one of the most important problems and some kind of intervention is needed. Cosmetic therapy is one of the most useful interventions. [Erat & Addor \(2025\)](#) showed that recent advancements in cosmetic science signal a pivotal shift from a narrow emphasis on external esthetics to a more holistic approach that embraces both internal and external well-being. [Gok et al. \(2023\)](#) showed that the global increase in the aging population has therefore driven a demand for effective anti-aging strategies, leading to extensive research in this field. Cosmetic therapy may be useful in the future.

There is some evidence of effect of cosmetic therapy on physiological aspects. [Ikeuchi et al. \(2017\)](#) examined the effect of cosmetic therapy on frontal lobe activation by functional near-infrared spectroscopy (fNIRS) for healthy women and showed a beneficial effect of cosmetic therapy on the brain function of participants with depression and/or dementia.

[Sakatani \(2015\)](#) employed time resolved spectroscopy (TRS) to evaluate the effect of cosmetic therapy on prefrontal cortex (PFC) activity in elderly females in nursing homes. [Tanida & Sakatani \(2014\)](#) also showed the effects of cosmetic therapy on cognitive function. [Machida & Shirato \(2020\)](#) suggested that cosmetic therapy positively affects the background factors of dementia in brain.

These physiological studies were from brain and there were few studies from automatic nervous system. In these days, [Rizzi et al. \(2021\)](#) or [Haykal et al. \(2025\)](#) suggested that efficacy of dermatological and cosmetic approaches should also be evaluated in the context of their interactions of nervous and neuroimmune system, in order to achieve a more integrated and holistic effect. Thus, a study from automatic nervous system was needed.

On the other hand, there were few studies from psychological aspect. [Zhang et al. \(2020\)](#) showed the impact of routine skin care on the quality of life for new young mothers. [Kawai et al. \(2016\)](#) showed effects of cosmetic therapy on subjective healthy feelings or depression for healthy elderly living in the communities. [Yoshida et al. \(2007\)](#) investigated short and long term effects of cosmetic therapy for healthy females from both physiological and psychological aspect. As effects of short time, mood measured by face scale improved and parasympathetic nerve decreased measured by blood pressure. As for long term effects, happiness and mood improved, but there were no effects in physiological aspects. Although they measured parasympathetic nerves and psychology, they used only blood pressure

for parasympathetic nerve and face scale for mood, much more strict tools were needed. Moreover, since Watanabe (2013) investigated impression as subjective feeling for cosmetic therapy, we also needed to investigate impression referring to a previous study (Watanabe, 2013). We defined “short term” as pre and post cosmetic therapy one time, “long term” as pre and post after 1 week in the present study.

Thus, we investigated effects of cosmetic therapy from physiological aspect including short and long term factor, mood, and impression. The purpose of this study was to investigate effects of cosmetic therapy on automatic nervous system, on mood measured by the Profile of Mood Scale, and impression for cosmetic therapy.

## 2. Method

### 2.1. Participants

In experiment 1, participants were 14 (5 male, 9 female) elders. The number of elderly people was 1 person at 60 years, 11 people at 70 years, 2 people at 80 years. Cognitive function was measured by Mini Mental Scale Examination (MMSE). The range of scores is from 0 to 30 points. The range of scores was from 23 to 30 point, and the mean MMSE score was 28. Generally cognitive function was normal. They were elders in elder's college in a university. So, they could move freely and almost healthy. Inclusion criteria were: 1) Elders could complete the questionnaire; 2) They could communicate with others. Exclusion criteria were that elders had skin troubles.

In experiment 2, the same participants of experiment 1 without 3 participants received. The reasons for dropout were as follows: One caught a cold, and two had something to come up. Then, 11 participants had second session as experiment 2. participants were 11 (4 male, 7 female) elders. The number of elderly people was 1 person at 60 years, 8 people at 70 years, 2 people at 80 years.

### 2.2. Cosmetic Therapy Program

The therapist was certified by Shiseido company with training. The cosmetic therapy included the following program. 1) Explanation about expected effects cosmetic therapy both on physical and mental aspects; 2) Relaxation including stretch; 3) Skin care using all in one gel and massage of face stimulating parotid gland or submandibular gland, stimulating face skin; 4) Make up using eyebrow, lipstick, and cheek. The instructor often talked with elders warmly. After makeup, elders looked themselves with mirror. They completed questionnaires pre and post. Staff took pictures pre and post. So, it was 60 minutes in total.

### 2.3. Questionnaires and Measurement

We used the following questionnaires.

- 1) Automatic nervous system: We used the “Hirou stress kei MF100” (Fatigue

Stress Measurement MF100) made by Murata Manufacturing Co., Ltd. A participant gripped the instrument using both right and left thumb, the instrument measures heartbeat, and analyzed and translated into automatic nervous system. It measures sympathetic nervous system Low Frequency (LF) which is sympathetic nervous system and High Frequency (HF) which is parasympathetic nervous system. The LF/HF shows the balance of automatic nervous system.

2) Profile of Mood Scale 2 (POMS 2): POMS 2 was developed by [Heuchert & McNair \(2012\)](#) and translated by [Yokoyama \(2015\)](#). The POMS consisted of 7 factors: Tension-Anxiety (TA), Anger-Hostility (AH), Fatigue-Inertia (FI), Vigor-Activity (VA), Confusion-Bewilderment (CB), Depression-Dejection (DD), and Friendship. The Friendship was not related to total mood disturbance, we did not include. Then, there are 5 question items about 6 factors, a participant measure using from 0 (not experience) and to 4 (often experience). The only VA shows positive mood, so the Total Mood Disturbance was calculated (TA + AH + FI + CB + DD) – VA). We used the TMD as indication of well-being of mood. High score means high mood disturbance.

3) The psychological well-being from cosmetic therapy. We referred to [Watanabe \(2013\)](#). We chose 4 questions (Motivation, Waking up, Comfort, and Vigor) which showed significance between pre and post cosmetic therapy in [Watanabe \(2013\)](#).

Participants evaluated each question by 10-point Likert scale.

## 2.4. Procedure

We recruited participants in elder college by flyer. In experiment 1, 14 healthy elders received cosmetic therapy once and a researcher measured automatic nervous systems by an instrument. It measured LF (Low Frequency), HF (High frequency), and LF/HF which means balance of LF and HF and high score show high activity and well-being. We used this indication.

In experiment 2, the same elders without three elders received cosmetic therapy as second session and completed the Mood by the Profile of Mood Scale 2 (POMS 2) and questions about impression for cosmetic therapy in “Motivation”, “Waking up”, “Comfort”, and “Vigor” by 10 Likert scale.

As measurement condition of automatic nervous system, the study was conducted from 10:00 AM to 15:00 PM, there was no special restriction such as meal or sleep time. Duration of measurement of the instrument in each session was 90 seconds.

## 2.5. Data Analysis

We conducted the basic statistics and conducted the Wilcoxon signed-rank test as a non-parametric test between pre and post cosmetic therapy.

## 2.6. Ethics

We performed this study in accordance with the Declaration of Helsinki. This study was approved by the Research Ethics Committee of Nisikyusyu University (25AVX22).

### 3. Results

About experiment 1, we showed the results of Wilcoxon signed rank test (**Table 1**). Both HF and LF did not significantly decrease, and LF/HF significantly increased ( $p < .01$ ).

**Table 1.** Result of Wilcoxon signed rank test on automatic nervous system pre and post in one time (N = 14).

	Pre	Post	<i>p</i> value
LF	73081.7	1621.8	ns
HF	66254.9	1844.7	ns
<b>LF/HF</b>	<b>1.63</b>	<b>2.85</b>	<b><i>p</i> &lt; .01</b>

About experiment 2, we showed the results of Wilcoxon signed rank test (**Table 2**).

Both LF and HF did not significantly decrease, and LF/HF significantly increase ( $p < .01$ ).

**Table 2.** Result of Wilcoxon signed rank test on automatic nervous system before one time and after second cosmetic therapy (N = 11).

	Pre	Post	<i>p</i> value
LF	1422.84	330.2	ns
HF	2037.23	365.99	ns
<b>LF/HF</b>	<b>1.49</b>	<b>3.36</b>	<b><i>p</i> &lt; .01</b>

As for POMS 2, we showed the results of Wilcoxon signed rank test (**Table 3**).

The TA (tension-anxiety) score significantly decreased ( $p < .05$ ). Also, TMD (Total Mood Disturbance) significantly decreased ( $p < .05$ ).

**Table 3.** Results of Wilcoxon signed rank test on scores of each factor in POMS.

	TA	AH	FI	VA	CB	DD	TMD
Pre	3.91	1.55	1.45	10.3	2.09	1.73	.45
post	1.73	.73	.45	12.0	1.00	.64	-7.45
<i>P</i>	<i>p</i> < .05	ns	ns	ns	ns	ns	<i>p</i> < .05

About impression for cosmetic therapy, the score for Vigor 7.46, the Waking up 7.34, the Comfortable 7.45, the Vigor 7.55 of 10 full points. Totally elders seemed to have good impression.

### 4. Discussion

#### 4.1. Effects of Cosmetic Therapy on Automatic Nervous Systems

In experiment 1, elders received cosmetic therapy once, and the score of LF/HF

significantly increased. LF/HF means activity and balance of nervous system. It shows that only one-time cosmetic therapy was useful to improve elder's activity. It may be because that high tension or anxiety reduced by "touch" or "massage" in cosmetic therapy. Also, the make up with cheek or lipstick changed from flat color to bright color in face, elder's mind activated. That is, participants' negative tension decreased and activity increased, then the balance of automatic nervous system work week. So, LF/HF might increase.

In experiment 2, the score LF/HF also significantly increased pre and post, and it means that long term cosmetic therapy also promoted activity and balance of nervous system. This fact is different of [Yoshida et al. \(2007\)](#) in which there was no significance in physiological aspect measured by blood pressure, pulse, surface temperature pre and post after three months cosmetic therapy for healthy female elders or elders with dementia. This difference might be caused by duration of cosmetic therapy or instruments of measurement. We need to investigate these points.

#### **4.2. Effects of Cosmetic Therapy on Mood**

As for mood of the POMS 2, TA significantly decreased. [Yamaguchi \(2014\)](#) said that by touching the skin, the physiological substance called oxytocin is secreted in the brain, and it promotes relaxation and helps to build relationships. Thus, touching and talking with the cosmetic therapist promoted relaxation and TA might decrease.

Moreover, TMD (Total Mood Disturbance) significantly decreased. It showed that elders experienced comfortable mood state totally and increased well-being. Integrating the increase of LF/HF and decrease of TMD score, cosmetic therapy affected both physiological and psychological state at the same time. This result supports a previous study. Maintaining a positive emotional balance has been shown to play a key role in psychological well-being and its increasingly regarded as a determinant of healthy aging ([Gautam et al., 2024](#)). [Tagai \(2021\)](#) also suggested importance of physical interaction and mental. In future, nervous and neuroimmune systems to achieve more integrated and holistic effects ([Haykal, et al., 2025](#)) will be investigated.

#### **4.3. Impression for Cosmetic Therapy**

As for impression, the score for "Motivation" 7.46, the "Waking up" 7.34, the "Comfortable" 7.45, the "Vigor" 7.55 of 10 full points. Totally elders seemed to have good impression. Comparing [Watanabe \(2013\)](#), the score of "Motivation", "Waking up", "Comfortable", were about 50 point and the "Vigor" 40 point in 100 VAS (Visual Analog Scale). The impression points in the present study were higher than [Watanabe \(2013\)](#). The reason for this difference might be from participant. Participants in [Watanabe \(2013\)](#) were healthy young women, and those in the present study were elders of 70 years old including male and female. Cosmetic therapy might be fresh and have impact on elderly people.

Previous study showed that the impact of skin aging may extend beyond physical health, potentially affecting social interactions and self-esteem (Son et al., 2021). We need to study much more effects on physical and psychological aspects.

#### 4.4. Limitation

As limitation, we did not establish a control group. So, the effect of cosmetic therapy in this therapy is not really validated. And the number of participants was small and we need to include many more participants.

#### 5. Conclusion

Cosmetic therapy affects automatic nervous system, tension-anxiety and total mood disturbance. Effects of cosmetic therapy were shown both from physiological and psychological. Elders had high evaluation of impression of it. Utility of cosmetic therapy was suggested.

#### Funding

This study is supported by Dean's Discretionary Expenses in Nishikyusyu University.

#### Conflicts of Interest

The author declares no conflicts of interest regarding the publication of this paper.

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