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Effects of complementary-alternative therapy on the decrease of obesity (cellulite) focusing on aroma therapy

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***Abstract*---**Background/Objectives: The objective of this study is to examine the effectiveness of complementary-alternative therapy that could reduce side effects of medical treatment by analyzing and researching the decrease of cellulite which is an element of obesity with the use of aroma therapy among complementary-alternative therapies. Methods/Statistical analysis: This study surveyed the general characteristics and lifestyle habits by using the questionnaire targeting the female university students with cellulite, conducted the experimental treatment on thighs and abdomen by using essential oil, and then measured changes before/after the treatment. Using the SPSS PC + Window ver. 25.0, this study conducted the frequency analysis, reliability analysis, and ANOVA. Findings: In the results of this study, first, the equivalence test on the general characteristics and lifestyle habits of research subjects did not show significant differences. Second, the sizes of thigh and abdomen in the experimental group using essential oil were significantly decreased, which was statistically significant. Improvements/Applications: This study verified the effects of aroma therapy on the decrease of obesity(cellulite). There should be continuous follow-up researches on the verification of various complementary-alternative therapies.

***Keywords*---**complementary-alternative therapies, obesity, cellulite, skin fold caliper, essential oil.

Introduction

Cellulite that is universally formed by obesity in women after adolescence, could be generally found in specific body areas such as thighs, hips, and legs[1]. The cellulite has been perceived as a factor that causes aesthetic and health problems to women[2]. There are various methods for reducing cellulite such as exercise therapy, dietary therapy, liposuction, and medication. The medication which is a generally-used method cannot completely heal the cellulite itself, and the Ministry of Food and Drug Safety bans the long-term use for more than a year. Even though the surgery can present great effects within a short time, it is hard to exclude the possibility to be exposed to side effects such as pain, economic burden, and nutritional deficiency after surgery, and the risk of life due to the short period of accumulating the clinical basis[3,4]. Among the alternative therapies, the aroma therapy is a natural method to heal human's mind and body as an effective method for improving the circulation of blood and lymph. It has been used for thousands of years in many ancient civilizations such as Egypt, China, and India, and it is recently used as alternative medicine and natural therapy[5]. In the etymological aspect, the word 'aroma' means a fragrant plant or grass in Greek. Today, the treatment using essential oil is limited to aroma therapy [6]. Among many essential oils, this study used rosemary oil, patchouli oil, and zingiber oil used for lipolysis, decrease of edema, and circulation of stagnant body fluids. The rosemary extract could be effectively used for obesity based on its effects on inhibiting the differentiation of fat cells[7]. The patchouli as a diuretic action, stimulates the digestive system, and helps the intestinal peristalsis, which has effects on weight loss[6]. In case of zingiber officinale roscoe which is a plant belonging to Tohehe Zingiberaceae, its root and stem have been widely used in folk remedies. As the ginger oil is expressed as 'warmly heating up', it is helpful for blood circulation by accelerating the artery circulation[8,9]. This study aims to examine the effectiveness of complementary-alternative therapy that could reduce side effects of medical treatment by analyzing and researching the decrease of cellulite which is an element of obesity with the use of aroma therapy among alternative therapies.

Research methods

Research design

This study has been designed to understand the effects on the decrease of cellulite by applying aroma therapy to the subjects with cellulite(Fig. 1). After conducting the experimental treatment on thighs and abdomen targeting the female university students by using essential oil, this study measured changes before/after the treatment.

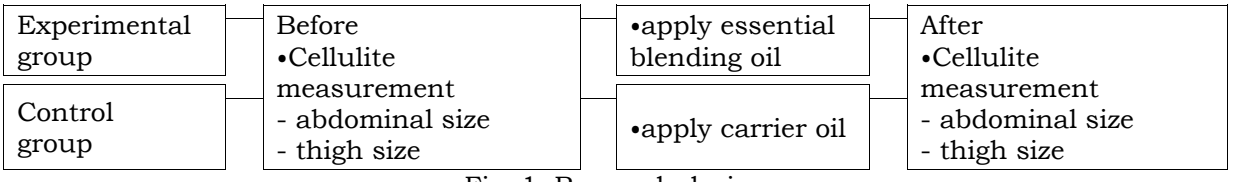

Fig. 1. Research design

Research subjects

From October 1st 2021 to November 31st 2021, this study conducted a survey targeting total 26 female university students of S university located in D city of C province in Korea after explaining the objectives, experiment method, and expected effects of this study, and asking them to fill out a consent form of participation. As the research subjects, this study selected people who had no special diseases, did not change their lifestyle during the period of experiment, and conducted no other interventional therapy. Through the random selection method, total eight sessions of treatment were provided to 13 subjects of experimental group using essential oil and another 13 subjects of control group without using essential oil twice a week for four weeks.

Research tools

Questionnaire on the general characteristics

The questionnaire on the general characteristics of research subjects was composed of total eight items such as age, height, weight, BMI(Body Mass Index), drinking, late-night snack, smoking, and exercise of subjects. The research subjects were explained that they could stop participating in this study anytime during the research period, and that the questionnaires of this study would be anonymously handled and not be used for other than the objectives of this study. After distributing the questionnaires to all the 26 subjects who agreed to participate in this study, they were asked to sign their own autograph on the consent form, and then to fill out the questionnaire.

Measurement of thigh

When the research subjects were standing upright, the central part between inside of patella and groin was measured three times, and then the mean value was calculated. The measurement was performed before the first experimental treatment and after the eighth experimental treatment. The thickness of thigh subcutaneous fat was measured by an expert with a national skincare license by using a measuring tape(Fig. 2).

Fig.2. Tape measuer

Fig.3. Skin fold caliper

Measurement of abdomen

When the research subjects were standing upright, the part 2cm apart to the right from the belly button was held vertically, and measured three times, and then the mean value was calculated. The measurement was performed before the first experimental treatment and after the eighth experimental treatment. The thickness of abdomen subcutaneous fat was measured by an expert with a national skincare license by using a skin fold caliper(Fig. 3).

Application of experimental treatment

During the experimental treatment two times a week for four weeks, the 13 subjects of experimental group were applied with essential oil for 15 minutes while another 13 subjects of control group without using essential oil were applied with carrier oil for 15 minutes. The blending of essential oil was 2%, and the carrier oil was mixed with zingiber, patchouli, and rosemary in the proportion of 4:3:3.

Data analysis method

The collected data was analyzed by using the SPSS 25.0 Statistics Program. The equivalence of the perception of ordinary lifestyle habits and general characteristics of research subjects was tested by using the x^2 test and Independent t-test. The pre/post changes in both groups were analyzed by using the paired t-test and Independent t-test. The significance level for the verification of hypotheses was $p<.05$.

Results

Equivalence test on the general characteristics & lifestyle habits of research subjects

The research subjects of this study were total 26 people including 13 subjects of experimental group using essential oil and another 13 subjects of control group without using essential oil. The results of the equivalence test on both groups did not show significant differences in age, height, weight, and BMI($p>.05$). In relation to lifestyle habits, there were no significant differences in alcohol, late-night snack, smoking, and exercise($p>.05$)[Table 1].

Table 1. Homogeneity test of general and lifestyle between two groups (N=26)

Characteristics	Massage reflexology with essential oils(n=13)	Massage reflexology without essential oils(n=13)	t or x^2	*p*
	Mean±SD or n(%)	Mean±SD or n(%)		
Age(yrs)	21.15±1.14	20.31±0.63	-2.336	.023
Height(cm)	162±3.91	161±4.06	-786	.765
Weight(Kg)	54±5.50	62±10.00	2.771	.019

BMI	22.77±2.80	23.92±4.66	.765	.335
Alcohol				
Less than 1	4(30.8%)	4(30.8%)	-235	.817
Less than 2	4(30.8%)	5(38.5%)		
Less than 3	5(38.5%)	4(30.8%)		
Midnight Snack				
Less than 1	3(23.1%)	2(15.4%)	.254	.800
Less than 2	5(38.5%)	6(46.2%)		
Less than 3	55(38.5%)	5(38.5%)		
Smoking				
Yes	6(46.2%)	6(46.2%)	.000	1.000
No	7(53.8%)	7(53.8%)		
Exercise				
Less than 1	3(23.1%)	5(38.5%)	-483	.634
Less than 2	6(46.2%)	4(30.8%)		
Less than 3	4(30.8%)	4(30.8%)		

BMI=body mass index (M±SD)*: Mean±Standard Deviation

Changes before/after applying the experimental treatment

Changes in thigh

In the control group without aroma therapy using essential oil, the thickness of thigh was decreased from 21.92±2.66 to 21.46±2.66, which was not significant(p=.053). In the experimental group that received aroma therapy using essential oil, the thickness of thigh was decreased from 20.31±1.25 to 19.00±1.00, which was significant(p<.001)[Table 2].

Table 2. Aromatherapy Thigh Application

Groups	Pretest	Posttest	□a	*p*	Post-Pre	□□	*p*
	Mean±SD	Mean±SD			Mean±SD		
A control	21.92±2.66	21.46±2.66	-2.14	.053	-462±0.77	-5.22	.000
B experimental	20.31±1.25	19.00±1.00	-6.27	.000	-1.30±0.75		

Changes in abdomen

In the control group without aroma therapy using essential oil, the thickness of abdomen subcutaneous fat was decreased from 4.62±1.60 to 4.54±1.76, which was not significant(p=.753). In the experimental group that received aroma therapy using essential oil, the thickness of abdomen subcutaneous fat was decreased from 4.00±1.41 to 3.23±1.36, which was significant(p<.05)[Table 3].

Table 3. Aromatherapy Abdominal Application

Groups	Pretest	Posttest	□a	*p*	Post-Pre	□□	*p*
	Mean±SD	Mean±SD			Mean±SD		
A control	4.62±1.60	4.54±1.76	.322	.753	-.077±.862	-2.66	.013
B experimental	4.00±1.41	3.23±1.36	4.62	.001	-.769±0.75		

Discussions

In order to examine the effects of complementary-alternative therapy on the decrease of obesity(cellulite) of female university students, this study comparatively analyzed the experimental group that applied essential oil to thigh and abdomen, and the control group that did not apply essential oil.
Examining the researches on complementary-alternative therapies for obesity/cellulite care, Han et al.,(2010) reported significant differences in the results of experimenting the effects of Chuna manual therapy and Swedish massage on the decrease of abdominal obesity of middle-aged women[10]. Kim(2013) reported significant changes in the results of measuring the change of cellulite before/after care by using the endermologie equipment for the relief of cellulite[11]. Jeong(2010) showed significant differences in the decrease of abdominal obesity of women in their 20s in the results of conducting the high-frequency procedure combined therapy[12]. With the gradually-increased interest in alternative therapies that could complement the weaknesses of modern medical science, the aroma therapy is grabbing huge attention as a natural therapy for health/beauty care. Especially, Jeong(2003) recommended the combination of massage and aroma therapy for health care[13]. Based on the research[14] by Jeong et al.,(2016) reporting that it would be helpful for relieving women's premenstrual syndrome, this study using essential oil might be significant in the aspect of handling the interested area such as health and beauty care of modern people.

In the results of conducting the equivalence survey on lifestyle habits of experimental group and control group, there were no significant differences in physical condition and lifestyle habits. This means that the subjects of this study were in the same condition without differences in external factors. In the results of this study applying essential oil to aroma therapy as one of the methods to relieve obesity, the measured thicknesses of thigh and abdomen were all significantly decreased like thigh before application(20.31±1.25) and after application(19.00±1.00), and abdomen before application(4.00±1.41) and after application(3.23±1.36). In the research by Yun et al.,(2009), the body fat percentage and sizes of thigh and calf were decreased in the results of conducting massage using essential oil for the lower-body obesity care of female university students[15]. In the research by Lee(2009), the aroma abdomen massage combined with behavioral modification therapy was effective for reducing the anthropometry and body composition of women in their 20s-30s with abdominal obesity[16]. Such results of those preceding researches accord with the results of this study showing the effects of aroma therapy using essential oil on the decrease of cellulite size. In the limitations of this study, this study used the

convenience sampling method for research subjects in a population limited to a certain area, could not completely control individual dietary life and daily life of research subjects, and could not use repetitive and various complementary-alternative therapies for the verification.

Conclusions

This study examined the effects of aroma therapy which is one of the complementary-alternative therapies on obesity(cellulite) of female university students. In this study applying essential oil to aroma therapy, there were changes in the sizes of thigh and abdomen, which was statistically significant. This study could be used as the basic data for researches on complementary-alternative therapies as a method of obesity care that excludes the possibility to be exposed to side effects such as pain, economic burden, and nutritional deficiency after surgery, and the risk of life.

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