



Article

**The Effect of Ear and Body Acupuncture Therapy on Reducing Waist Circumference and Body Mass Index in Overweight Cases at Rinjani Sragen Gymnastics Studio**

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**ABSTRACT**

The incidence of overweight in adults is increasing over time. Being overweight is a body condition that results in excessive fat mass. Overweight is caused by many factors, including age, physical activity, gender, hormones, genetics, and environment. Acupuncture therapy can be used as a support for weight loss efforts because acupuncture can affect the central nervous system and activate specific areas in the brain. This study aims to determine the effect of ear and body acupuncture therapy on reducing waist circumference and body mass index in overweight cases at the Rinjani Sragen Gymnastics Studio. This study used a quantitative method of research using a "Quasi-Experimental" research design. The study sample was 45 people who were divided into 3 treatment groups, namely group I ear acupuncture therapy, group II ear and body acupuncture therapy, and group III body acupuncture therapy. The study began in January to March 2025 and was conducted at the Rinjani Sragen Gymnastics Studio. One-way ANOVA test analysis on waist circumference has a significant value of  $p$  of 0.017 ( $p < 0.050$ ) and for body mass index,  $p=0.004$  ( $p < 0.050$ ), which means that ear and body acupuncture therapy affects reducing waist circumference and body mass index in overweight cases.

**I. INTRODUCTION**

The incidence of overweight in adults is increasing over time. Being overweight is a body condition that results in excessive fat mass<sup>(1)</sup>. Overweight is caused by many factors, including age, physical activity, gender, hormones, genetics, and environment. If overweight is not treated, the fat mass contained in the body will be further accumulated, causing obesity<sup>(2)</sup>. Obesity

can increase the risk of developing type 2 diabetes and heart disease, affect bone and reproductive health, and increase the risk of certain cancers<sup>(1)</sup>. According to Eastern medicine, overweight is a condition of excessive fat accumulation caused by excessive consumption of fatty or sweet foods. Foods with excessive fat can cause fat accumulation, causing the spleen and stomach organs to work too hard. Overweight in Traditional Chinese Medicine

(TCM) is divided into two types, namely excess and deficiency obesity. Excess obesity is congenital or caused by eating excessively fatty or sweet foods. The deficiency type is caused by spleen and stomach deficiencies, resulting in dampness and phlegm in the interior of the body<sup>(2)</sup>.

The global prevalence of obesity shows a higher risk of obesity in women than men<sup>(3)</sup>. The prevalence of overweight in the World in 2022, 2.5 billion adults aged 18 years and over who were overweight, including more than 890 million adults who were obese<sup>(1)</sup>. The prevalence of obesity in Indonesia in 2023 in the population aged over 18 years increased from 21.8% (2018) to 23.4% (2023)<sup>(4)</sup>. The results of the Central Java Province Riskesdas in 2018 stated that the prevalence of nutritional status in Sragen Regency, based on the IMT category of adults aged 18 years and over, with 11.29% of men and 14.41% of women experiencing overweight<sup>(5)</sup>.

Based on the description above, the researcher is interested in conducting research with the title "The Effect of Ear and Body Acupuncture Therapy on Decreasing Waist Circumference and Body Mass Index in Overweight Cases at the Rinjani Sragen Gymnastics Studio" because not many people use acupuncture therapy as a supporting therapy for handling overweight cases".

## II. METHODS

Based on the objectives of this study, the research method entitled "The Effect of Ear and Body Acupuncture Therapy on Decreasing Waist Circumference and Body Mass Index in Overweight Cases at Rinjani Sragen Gymnastics Studio" is quantitative research. This study uses a quasi-experimental design with a research design of nonequivalent control group design. In this study, researchers divided participants into 3 groups: group 1, ear acupuncture; group 2, ear and body acupuncture, and group 3, body acupuncture. The sampling technique used in this study

was total sampling and met the research criteria.

This research was conducted from October 2024 to March 2025 at the Rinjani Sragen Gymnastics Studio. The population in this study was members of the Rinjani Sragen gymnastics studio who were overweight. The independent variable in this study is ear and body acupuncture therapy with the points used, namely the hunger point (TG3), spleen point (IC8), stomach point (CR1), GB26 Daimai, Ren12 Zhongwan, Ren4 Guanyuan, ST25 Tianshu, and ST40 Fenglong. The dependent variable in this study is the change in waist circumference and body mass index in overweight cases at the Rinjani Sragen Gymnastics Studio.

Statistical test data in this study were processed using the Shapiro-Wilk test for normality test, homogeneity test using the Levene Test, and hypothesis testing using One Way Anova and Post Hoc LSD tests.

## III. RESULT

This research began with a preliminary study in October-November 2024 to determine the number of subjects who were overweight. The results of preliminary study obtained 45 research subjects and met the research criteria. The research subjects were divided into 3 groups, with each group consisting of 15 research subjects. The three groups received therapy for 10 sessions.

**Table 1. Characteristics of Respondents**

| Characteristic    | n  | %    |
|-------------------|----|------|
| <b>Age (Year)</b> |    |      |
| 20-28             | 9  | 20.0 |
| 29-36             | 22 | 48.9 |
| 37-44             | 14 | 31.1 |
| <b>Jobs</b>       |    |      |
| <b>Occupation</b> | 9  | 20.0 |
| Self-employed     | 5  | 11.1 |
| Trader            | 2  | 4.4  |
| Farmer            | 3  | 6.7  |
| Affiliate         | 1  | 2.2  |
| Housewife         | 14 | 31.1 |
| Private           | 4  | 8.9  |
| Teacher           | 3  | 6.7  |
| Tailor            | 2  | 4.4  |
| Makeup Artist     | 2  | 4.4  |

| Characteristic  | n  | %    |
|---|----|------|
| <b>Hereditary Factor</b>                                  |    |      |
| Yes   | 17 | 37.8 |
| No  | 28 | 62.2 |
| <b>Acupuncture Syndrome</b>                               |    |      |
| Accumulation of excess heat in the stomach and intestines | 29 | 64.4 |
| Damp obstruction and spleen deficiency                    | 16 | 35.6 |

Table 1 shows that most of the research subjects who were overweight were aged 29-36 years, as many as 22 people (48.9%), for work most of the research subjects were housewives as many as 14 people (31.1%), most of the research subjects were overweight not because of heredity as many as 28 people (62.2%). The most common syndrome differentiation is the accumulation of excess heat in the stomach and intestines as many as 29 people (64.4%).

**Table 2. Results of One Way Anova Test and Post Hoc Test on Waist Circumference**

| Group            | Mean | SD   | p      |
|------------------|------|------|--------|
| <b>Group I</b>   | 5.53 | 2.07 |        |
| <b>Group II</b>  | 3.60 | 1.84 | <0.017 |
| <b>Group III</b> | 5.60 | 2.29 |        |

Table 2 shows that the sig. (significance) value in the three groups is  $p = 0.017$ , meaning that  $p < 0.050$ , so  $H_0$  is rejected and  $H_a$  is accepted. Post Hoc test shows the significance value between group 1 vs group 3 is 0.930, where the value of  $p > 0.050$ , which means there is no significant effect between group 1 vs group 3. In group 2 vs group 1, the significance value between groups is 0.014 where the value of  $p < 0.050$ , which means there is a significant effect between group 2 vs group 1. In group 2 vs group 3 the significance value between groups is 0.012 where the value of  $p < 0.050$  which means there is a significant effect between group 2 vs group 3.

**Table 3. Results of One-Way Anova Test and Post-Hoc Test on Body Mass Index**

| Group            | Mean | SD   | p      |
|------------------|------|------|--------|
| <b>Group I</b>   | 6.93 | 4.22 |        |
| <b>Group II</b>  | 4.93 | 2.38 | <0.004 |
| <b>Group III</b> | 9.60 | 3.89 |        |

Based on table 5 shows that the sig (significance) value in the three groups is  $p = 0.004$ , meaning  $p < 0.050$ , so  $H_0$  is rejected and  $H_a$  is accepted. Post Hoc test and obtained a significance value between group 1 vs group 3 of 0.048, where the value of  $p < 0.050$ , which means there is a significant effect between group 1 vs group 3. In group 2 vs group 1, the significance value between groups is 0.134, where the value of  $p > 0.050$ , which means there is no significant effect between group 2 vs group 1. In group 2 vs group 3 the significance value between groups is 0.001, where the value of  $p < 0.050$ , which means there is a significant effect between group 2 vs group 3.

#### IV. DISCUSSION

The results of this study will be discussed based on the theory in previous studies. This study used 45 research subjects and was divided into 3 groups, which aimed to determine the effect of ear and body acupuncture therapy on reducing waist circumference and body mass index. The results of this study indicate that ear and body acupuncture therapy affects reducing waist circumference and body mass index in overweight cases at the Rinjani Sragen Gymnastics Studio.

This study is in line with some of the first studies using points GB26 Daimai, SP15 Daheng, ST25 Tianshu, CV12 Zhongwan, ST28 Shuidao, TE5 Waiguan, and GB41 Zulinqi, which are done every 3 times a week for 4 weeks, can affect weight loss and waist circumference ratio.

The results were statistically significant ( $p < 0.010$ ) and proved that acupuncture therapy can help reduce weight, BMI or BMI and waist circumference ratio in overweight cases<sup>(6)</sup>.

The second study using GB28 Weidao, ST25 Tianshu, Ren9 Shuifen, Ren12 Zhongwan, Ren4 Guanyuan, SP6 Sanyinjiao, ST40 Fenglong, and LI11 Quchi points and ear acupuncture using hunger points, shenmen points, endocrine points, spleen points, stomach points, and small intestine points showed that body acupuncture and ear acupuncture had an effect on reducing waist circumference and body mass index<sup>(7)</sup>.

The decrease in body weight and waist circumference ratio occurred due to the effects of acupuncture therapy, which can regulate the endocrine system, improve digestion, reduce oxidative stress, and modulate metabolic molecules. Acupuncture affects the decrease of salivary amylase (S-Am), serum pepsinogen (SPG), and serum amylase (B-Am). These enzymes inhibit the function of excessive absorption in the gastrointestinal. In addition, there is a decrease in the active components of 5-Hydroxytryptamine (5-HT) and histamine in the microcirculation of the gastrointestinal tract, causing suppression of gastric acid secretion and stimulating colon contraction activity<sup>(8)</sup>.

In ear acupuncture needling the needles will stimulate the branches of the

nervus vagus in the ear, thereby increasing serotonin levels in the central nervous system. This stimulation will decrease food intake, increase energy utilization, and increase intestinal motility, resulting in weight loss. Acupuncture can cause an increase in beta endorphin levels in the blood plasma and central nervous system, which can trigger the breakdown of fat cells into free fatty acids and glycerol<sup>(9)</sup>.

## V. CONCLUSION

Based on the analysis of the above data using SPSS Statistics, ear and body acupuncture therapy on changes in waist circumference and body mass index at the Rinjani Sragen Gymnastics Studio with the test results using one way anova on the three groups on the decrease in waist circumference showed that the value of  $p = 0.017$ , while on the body mass index the value of  $p = 0.004$ , so that  $p < 0.050$ . The results of the Post Hoc test on waist circumference show that the order of the most influential therapy groups is ear and body acupuncture therapy, body acupuncture therapy, and finally ear acupuncture therapy. The results of the Post Hoc test on BMI showed that the order of the most influential therapy groups was ear and body acupuncture therapy, ear acupuncture, and finally body acupuncture therapy.

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