The Result of Suggestion for Low Energy Diet (1,000-1,200 kcal) in Obese Women to the Effect on Body Weight, Waist Circumference, and BMI

S. Kumchoo

Abstract—The result of suggestion for low energy diet (1,000-1,200 kcal) in obese women to the effect on body weight, waist circumference and body mass index (BMI) in this experiment. Quisi experimental research was used for this study and it is a One-group pretest-posttest designs measurement method. The aim of this study was body weight, waist circumference and body mass index (BMI) reduction by using low energy diet (1,000-1,200 kcal) in obese women, the result found that in 15 of obese women that contained their body mass index (BMI) $\geq$ 30, after they obtained low energy diet (1,000-1,200 kcal) within 2 weeks. The data were collected before and after of testing the results showed that the average of body weight decrease 3.4 kilogram, waist circumference value decrease 6.1 centimeter and the body mass index (BMI) decrease 1.3 kg.m^2 from their previous body weight, waist circumference and body mass index (BMI) before experiment started. After this study, the volunteers got healthy and they can choose or select some food for themselves. For this study, the research can be improved for data development for forward study in the future.

Keywords—Body weight, waist circumference, BMI, low energy diet.

I. INTRODUCTION

WEIGHT control by low energy diet (1,000-1,200 kcal) intake it's a way to control body weight for human body. Food and calories intake control for 1,100 kcal per day within a week (7,700 kcal per week) it can reduce 1 kilograms of body weight. Even if weight loss supplements may be associated with loosened dietary control in a real dining situation [1]. Weight control by eating behavior adjustment it can reduce the risk for diseases. The suitable weight control is 5-7% of body weight by decreasing energy and calories for food intake about 500-1,00 kcal per day or (1,00-1,200 kcal per day in women and 1,200-1,600 kcal per day in men) and it has to concentrate on fat and carbohydrate content in food, the low fat content food should be 25-30% fat content, carbohydrate content should be 55-60% per energy obtained per day and 30-45 minute workout a day, 3-5 days a week for suitable index weight control. In the previous studies about weight control are, [2] study for Weight perceptions, weight control and income, [3] study of A novel antioxidant beverage for body weight control based on coffee silver skin [4]. Taking weight-loss supplements may elicit liberation from dietary

control. A laboratory experiment and [5] the study of A weight loss program in a chiropractic practice: A retrospective analysis. For this study, the suggestion for low energy diet (1,000-1,200 kcal) in 15 obese women by selected menu was concerned for volunteers. Weight control factors were concerned as their body weight, waist circumference and body mass index (BMI) as the aim of this study.

II. MATERIALS AND METHODS

Fig. 1 The height measurement for BMI calculation

A. Obese Women Volunteers Index Measurement

For 15 obese women volunteers were selected from colleagues at Suan Sunandha Rajabhat University and they should be contained their body mass index (BMI) $\geq$ 30 measured by using followed this equation (body weight/height^2). The BMI was measure into 2 times before signing program and the end of program. The height measurement for BMI calculation was showed as Fig. 1.

B. Waist Circumference Measurement

Waist circumference is an adipose tissue index and it related to fat free mass in human body. Waist circumference measurement point for obese women volunteers showed in Fig. 2. Waist circumference measurement was measure into 2 times are before signing program and the end of program.

C. Body Weight Measurement

Body weight of obese women volunteers were weighed before program signing and the end of program by Body Composition Analyzer BC-418, TANITA weighing machine showed in Fig. 3. The obese women volunteers had to wear a prepared suit from researcher and take off their shoes before weighing and body weighing had to be before their breakfast. And then for 2 weeks All of their data were recorded and collected for using in this experiment.

S. Kumchoo is with the Department of Home Economics, Faculty of Science and Technology, Suan Sunandha Rajabhat University, Bangkok 10300, Thailand (phone: +6681-915-5591; fax: +662-160-1146; e-mail: sakuntra.ku@ssru.ac.th).

Fig. 2 Waist circumference measurement point for volunteers

Fig. 3 Body Composition Analyzer BC-418, TANITA weighing machine

D. Menu for Obese Women Volunteers

Within 2 weeks, the researcher suggested a set menu in each day for obese women volunteers. The volunteers had to eat a set menu showed below

Day 1:
- Breakfast- Rice porridge with minced pork and egg was showed in Fig. 4, coffee with 0% fat milk and sweetener
- Brunch- 0% fat milk or natural flavor yogurt
- Lunch- Boiled rice with roasted chicken and 200g of fresh vegetable
- Supplement- A green apple
- Dinner- Roasted chicken for 200 g. and 200 g. of fresh vegetable
- Before bed time- 0% fat milk or natural flavor yogurt

Day 2:
- Breakfast- 1-2 sliced whole wheat bread, boiled egg and coffee with 0% fat milk and sweetener
- Brunch- natural flavor yogurt
- Lunch- Roasted pork for 250 g. and natural flavor yogurt
- Supplement- A green apple
- Dinner- Boiled fish for 300 g. and 200 g. of fresh vegetable
- Before bed time- 0% fat milk or natural flavor yogurt

Day 3:
- Breakfast- 1-2 sliced whole wheat bread, boiled egg and a piece of ham
- Brunch- 0% fat milk or natural flavor yogurt
- Lunch- A ladle of boiled rice with spice soup of 100g chicken served with straw mushroom

- Supplement- A green apple
- Dinner- Vegetable soup with minced pork and liver
- Before bed time- 0% fat milk or natural flavor yogurt

Day 4:
- Breakfast- Rice porridge with minced pork and egg, coffee with 0% fat milk and sweetener
- Brunch- Natural flavor yogurt
- Lunch- A ladle of boiled rice with100g.fish sour soup
- Supplement- A green apple
- Dinner-Chinese steamed eggs with 200g. of cabbage
- Before bed time- 0% fat milk or natural flavor yogurt

Day 5:
- Breakfast- A ladle of boiled rice with vegetable soup with 100g pork and black coffee
- Brunch- Natural flavor yogurt
- Lunch- Noodle with 200g fish balls
- Supplement- A green apple
- Dinner- 200g of sea food salad
- Before bed time- 0% fat milk or natural flavor yogurt

Day 6:
- Breakfast- A ladle of boiled rice with 100g.of grilled pork
- Brunch- Natural flavor yogurt
- Lunch-150 g. of Thai rice noodle with sour soup and 50g. of fish ball, Boiled egg
- Supplement- A green apple
- Dinner- 150 g. of spicy chicken salad and vegetable as showed in Fig. 5
- Before bed time- 0% fat milk or natural flavor yogurt or 100-200 ml. of drinking water

Fig. 4 Rice porridge with minced pork and egg

Day 7:
- Breakfast- Macaroni with 100g. boiled chicken
- Brunch- 0% fat milk or natural flavor yogurt
- Lunch-Boiled rice with roasted chicken and 200g of fresh vegetable
- Supplement- A green apple
- Dinner- 200 g. grilled pork salad with 200 g. of vegetable
- Before bed time- 0% fat milk or natural flavor yogurt.

Day 8:
- Breakfast- Rice porridge with minced pork and egg, coffee with 0% fat milk and sweetener
- Brunch- 0% fat milk or natural flavor yogurt
- Lunch- Boiled rice with roasted chicken and 200g of fresh vegetable
- Supplement- A green apple

- Dinner- Roasted chicken for 200 g. and 200 g. of fresh vegetable
- Before bed time- 0% fat milk or natural flavor yogurt

Fig. 5 Spicy chicken salad and vegetable

Day 9:
- Breakfast- 1-2 sliced whole wheat bread, boiled egg and coffee with 0% fat milk and sweetener
- Brunch- natural flavor yogurt
- Lunch- Roasted pork for 250 g. and natural flavor yogurt
- Supplement- A green apple
- Dinner- Boiled fish for 300 g. and 200 g. of fresh vegetable
- Before bed time- 0% fat milk or natural flavor yogurt

Day 10:
- Breakfast- 1-2 sliced whole wheat bread, boiled egg and a piece of ham
- Brunch- 0% fat milk or natural flavor yogurt
- Lunch- A ladle of boiled rice with spice soup of 100g chicken served with straw mushroom
- Supplement- A green apple
- Dinner- Vegetable soup with minced pork and liver
- Before bed time- 0% fat milk or natural flavor yogurt

Day 11:
- Breakfast- Rice porridge with minced pork and egg, coffee with 0% fat milk and sweetener
- Brunch- Natural flavor yogurt
- Lunch- A ladle of boiled rice with100g.fish sour soup
- Supplement- A green apple
- Dinner-Chinese steamed eggs with 200g. of cabbage
- Before bed time- 0% fat milk or natural flavor yogurt

Day 12:
- Breakfast- A ladle of boiled rice with vegetable soup with 100g pork and black coffee
- Brunch- Natural flavor yogurt
- Lunch- Noodle with 200g fish balls as showed in Fig. 6
- Supplement- A green apple
- Dinner- 200g of sea food salad
- Before bed time- 0% fat milk or natural flavor yogurt

Fig. 6 Noodle with 200g fish balls

Day 13:
- Breakfast- A ladle of boiled rice with 100g.of grilled pork
- Brunch- Natural flavor yogurt
- Lunch-150 g. of Thai rice noodle with sour soup and 50g. of fish ball, boiled egg was shown in Fig. 7
- Supplement- A green apple
- Dinner- 150 g. of spicy chicken salad and vegetable
- Before bed time- 0% fat milk or natural flavor yogurt or 100-200 ml. of drinking water

Day 14:
- Breakfast- Macaroni with 100g. boiled chicken
- Brunch- 0% fat milk or natural flavor yogurt
- Lunch-Boiled rice with roasted chicken and 200g of fresh vegetable
- Supplement- A green apple
- Dinner- 200 g. grilled pork salad with 200 g. of vegetable
- Before bed time- 0% fat milk or natural flavor yogurt.

Fig. 7 Thai rice noodle with sour soup with fish balls and boiled egg

III. RESULTS AND DISCUSSION

From this experiment, the data of three factors to concentrate for 15 obese women volunteers from colleagues at Suan Sunandha Rajabhat University are Waist circumference, Body weight and body mass index (BMI) were recorded and collected and showed in Table I, the result can conclude that Waist circumference, Body weight and body mass index (BMI) for 15 obese women volunteers were decrease within 2 weeks.

For all data in Table I, 15 obese women volunteers can reduce all of three factors. The average differentiation value of body weight waist circumference and body mass index (BMI) after 2 weeks are 3.4 kilograms, 6.1 centimeters and 1.3 kg.m^2 respectively. The maximum differentiation body weight loss is 6.5 kilograms from obese women volunteer number 1. The maximum differentiation of waist circumference loss is 11.0

centimeters from obese women volunteer number 3 and the maximum differentiation for body mass index (BMI) is 2.08

kg.m^2 from obese women volunteer number 4 respectively.

TABLE I
WAIST CIRCUMFERENCE, BODY WEIGHT AND BODY MASS INDEX (BMI) FOR 15 OBESE WOMEN VOLUNTEERS

Volunteers NO.	Body weight (kg.)			Waist circumference (cm.)			Body Mass Index (kg/m^2)		
	Before	After	Differentiation	Before	After	Differentiation	Before	After	Differentiation
1	126.9	120.4	6.5	137.0	127.0	10.0	44.3	42.7	1.6
2	103.9	99.5	4.4	114.0	105.0	9.0	40.1	38.4	1.7
3	97.0	92.3	4.7	110.0	99.0	11.0	39.4	37.9	1.5
4	66.0	62.0	4.0	88.0	84.0	4.0	27.47	25.39	2.08
5	95.5	94.0	1.5	111.0	104.0	7.0	36.8	36.2	0.6
6	96.5	93.0	3.5	106.0	100.0	6.0	36.32	35.0	1.32
7	80.1	77.0	3.1	97.0	91.0	6.0	27.7	26.6	1.1
8	78.7	76.0	2.3	98.0	94.0	4.0	30.7	29.8	0.9
9	75.1	72.2	2.9	95.0	91.0	4.0	28.3	27.2	1.1
10	102.0	99.0	3.0	115.0	109.0	6.0	39.8	38.67	1.17
11	65.0	61.0	4.0	89.0	85.0	4.0	27.4	25.72	1.68
12	62.3	60.0	2.3	104.0	100.0	4.0	28.8	27.7	1.1
13	108.4	104.0	4.4	123.0	113.0	10.0	36.6	35.1	1.5
14	90.2	87.5	2.7	104.0	102.0	2.0	30.8	29.9	0.9
15	87.4	84.1	3.3	100.0	95.0	5.0	28.5	27.5	1
Average	88.9	85.5	3.4	106.1	99.9	6.1	33.5	32.3	1.3

From this experiment, the suggestion for low energy diet (1,000-1,200 kcal) in obese women from colleagues at Suan Sunandha Rajabhat University affected on their body weight, waist circumference and body mass index (BMI) as the aim of the study. The volunteers got healthy and they can choose some suitable food for themselves and know about low energy diet better. From this study, the researcher can adjust the others Thai herbs e.g. Seablite (*Suaeda maritima*) [6], [7] to the diet meals for increasing the fiber to the obese women volunteers and a researcher can improve the Seablite to be an ingredient for the diet meals recipe in the future.

V. CONCLUSION

Low energy diet intake affected on the body weight, waist circumference and body mass index (BMI).

ACKNOWLEDGMENT

REFERENCES

[1] Y. Y Chang. and W. B. Chiou, the liberating effect of weight loss supplements on dietary control: Applied nutritional investigation, *Nutrition*., 2014; 30: 1007-1010.
[2] D. W. Johnston and G. Lordan, Weight perceptions, weight control and income: An analysis using British data: *Economics and Human Biology*., 2014; 12: 132-139.
[3] N. M. Saez, M. Ullate, M. A. M. Cabrejas, P. Martorell, S. Genoves, D. Ramon and M. D. D. Castillo., A novel antioxidant beverage for body weight control based on coffee silver skin: *Food Chemistry*., 2014; 150: 227-234.
[4] Y. Y. C. Chang. and W. B. Chiou, Taking weight-loss supplements may elicit liberation from dietary control. A laboratory experiment: *Appetite*., 2014; 72: 8-12.
[5] A. DeMaria, C. DeMaria, R. DeMaria and J. Alcantara, A weight loss program in a chiropractic practice: A retrospective analysis: *Complementary Therapies in Clinical Practice*., 2014; 20: 125-129.
[6] Y. Sudjaroen, "Evaluation of ethnobotanical vegetables and herbs in Samut Songkram province" Procedia Engineering, 2012; 32: 160-165
[7] A. Pornpitakdamrong and Y. Sudjaroen. "Seablite (*Suaeda maritima*) Product for Cooking, Samut Songkram Province, Thailand", Food and Nutrition Science, 2014; 5: 850-856.