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## The Effect Of Mayo And Keto Diet and Physical Activities Toward Weight, Abdominal Circumference and Fat Thickness Reduction

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### Abstract

**Aim:** The aim of this research was for knowing and testing: 1) weight reduction after done the diet for 13 days; 2) the effect of mayo and keto diet towards consumer's physical activity; and 3) interaction between diet and physical activities.

**Methods:** The reseach method that used is experimental with the use of 2x3 factorial design. Sample for this research was whole population which is 30 people of dandelion catering consumer, starting from junior high school students to house wives. The instrument used for measuring abdominal circumference was meter, for measuring weight was scale, and for measuring the fat thickness used *skinfold*. Analysis of this research was using ANOVA two paths with the score of significant level  $\alpha = 0,05$ .

**Results:** The result of this research is: 1) The effect of keto and mayo diet towards weight, waist circumference, and fat thickness reduction, in significant level of  $< \alpha 0,05$ ; 2) diet effect (mayo and keto) and physical activity toward weight, waist circumference, and fat thickness reduction, in significant score for weight  $0.706 > \alpha 0,05$ , for waist circumference  $0.631 > \alpha 0,05$ , and for fat thickness  $.710 > \alpha 0,05$ .

**Conclusion:** The conclusion towards this reserach was: 1) there was a significant different effect between keto and mayo diet towards weight, waist circumference, and fat thickness reduction; 2) there was no different significant effect between diet (mayo and keto) and physical activity towards weight, waist circumference, and fat thickness reduction; and 3) there was no interaction between diet (keto and mayo) and activitiy (light, medium, high) towards weight, waist circumference, and fat thickness reduction.

### Keywords

*diet keto,*  
*mayo,*  
*weight,*  
*waist circumference,*  
*fat thickness*

## INTRODUCTION

Human Body needs complete food supply so that it can get energy source for everyday activities. Human's energy source comes from carbohydrate, fat, and protein. Carbohydrate becomes the main energy source within the body, then carbohydrate break down into a sugar which is becoming the energy source for our body. Body needs carbohydrate in a specific portion. When there is too much carbohydrate enters the body then not all carbohydrate turned into energy source by the body. The amount of the carbohydrate which is enters the body will turn into fat and heaped up within the body. This heaped up if happen continuously will result in various disruption such as obesity and diabetes.

Life style changes as a society that direct onto the modern habit. Along with a change, dietary habits also change. That food commonly has high calory because contain so much fat. This thing becomes characteristic of human life habit with foods that contain high calory

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while the physical activities getting decrease. The entry of too much carbohydrate or the use of minimum carbohydrate is the main factor of the occurrence of obesity.

Obesity is the accumulation of excess fat than is needed for bodily functions. Obesity has bad impact for health, such as easily attacked by serious disease, heart disease, high blood pressure, diabetes *mellitus*, and cardiovascular disease. There are several methods to reduce the weight among those with an exercise and keep the dietary habit. In reality, there are still many people who doing an exercise for reducing the weight, but not offset with healthy dietary habit. Physical training which is not accompanied by healthy dietary habit will be wasted in a matter of weight reduction. How about that concept changed by doing diet first and then supported by physical training.

Nowadays, many ways for diet or healthy dietary habit can be easily seen through the internet or social media, so that many kinds of diet variation appear in society, such as *food combining*, *tiger diet*, *mayo diet*, blood kind diet and detoxification. With the appearance of that diet variation, people are competing to follow this type of diet variation. *Food combining* was a dietary habit popularized by Essensi people in Palestine around  $\pm$  2000 years ago but haven't used *food combining* term. William Howard Hay was a famous surgeon that makes *food combining* popular in 1920 in United States. *Food combining* is a dietary habit which is adjusted by the natural mechanism of body function. *Tiger diet* or *high protein* is a strict dietary habit with only consume the meat and the processed with very less carbohydrate. The result of research in *The Journal of Nutrition*, low carbohydrate diet and high protein can decrease the weight, because this diet will turn the fat into energy source.

*Blood type diet* has a purpose to know the healthy dietary habit appropriate with a blood type. We need to know that kind of blood type have a risk attacked by specific disease, so this kind of diet is very recommended by the expert. Detox diet is a kind of diet special for detoxification, commonly is a kind of short-term diet with a purpose to decrease supply of chemical substance within the food. Food ingredients used in this diet using organic food and increase the food consumption that rich of vitamin, nutrients and antioxidant that needs by the body for detoxification process. In fact this kinds of diet that told before is not always suitable for all people, for example the diet that done by the one who have a hard work will not be the same with the diet done by the one who only sitting in the office. Chef and expert of healthy food Steby Rafael argue the important is understand the needs of nutrition dan metabolism condition when applying healthy dietary habit.

Nutrition proportion balance needs to be the focus of attention in choosing a diet program. Almost all diet programs succeeded decreasing the weight for a short-term; however the side effect and the shortcoming need to be consideration. Diet with a very low supply of calory has a high risk towards the health as the result of the nutrition imbalance, moreover for a long-term. The most important thing in a diet is the reductions of the weight which is gradual and furthermore can be kept and also gives a good effect towards the health. From several kinds of diet methods mentioned before the writer only discuss two diet methods, namely diet keto and mayo.

Ketogenic diet or usually called keto becoming the diet method which is believed capable of helping the body to avoid all kinds of negative things due to excessive carbohydrate heaped up. This diet principal is low carbohydrate, medium protein and high fat (van Berkel,et, al., 2018: 69). The low consumption of carbohydrate hoped can reduce the occurrence of accumulation in the body and break down fat into an energy source. Keto diet known already applied in 1920 and not the diet method that currently found. At first, keto diet known as one of the treatment method to control epilepsi in children. On the development ketogenic dietary habit later increasingly recognized by the public and now more widely used for weight loss.

There are five kinds of keto diet that commonly used in the whole world, namely: *Classical Ketogenic Diet* (CKD), *Medium Chain Triglyceride* (MCTKD), *Low-glycemic Index Treatment* (LGIT), *Modified Atkins Diet* (MAD), *Modified Ketogrnic Diet* (MKD). This

Dandelion catering is using MKD (*Modified Ketogenic Diet*) diet kind, with the level of moderate keto. Keto diet divided into two, moderate keto and *high-protein ketogenic diet*. *Moderate keto* have a composition of 75% fat, 20% protein, and 5% carbohydrate, while *high-protein ketogenic diet* 60% fat, 35% protein and 5% carbohydrate. Keto diet has strength and weakness. The strength of keto diet apart from treatment of epilepsy sufferer in children also for treatment in *alzheimer* disease, solution for gluten allergy sufferer and diabetes. Apart as treatment for disease the strength can decreasing the weight, controlling the blood sugar, increasing mental focus, physical resistance increase and giving a good supply of nutrition. Aside from having the strength, keto diet also has a weakness such as need time to adapt, difficulty to limit the carbohydrate, difficulty to overcome the body reaction and difficulty to pick food ingredients (Hernandez, et. al., 2018: 391).

Keto diet becomes popular recently. Diet which is consuming high fat and healthy protein which is believed can reduce the weight appropriately, but there are several people which unsuitable for doing this kind of diet because can endanger the health of the keto dieters. A person who has complaints about gout and cholesterol are not recommended to go on this diet, because it can cause high levels of uric acid and cholesterol.

Mayo diet is a simple diet program which is help to reduce body weight (Anastasia, 2015: 4). Mayo diet is a healthy diet which pay attention to nutritional intake so that when dieting do not need to endure hunger for days. This diet recommended consuming the kind of food which is rich of fiber, low fat, low cholesterol and free of sugar and salt. Vegetables and fruits are the example of the foods which rich of fiber, this is much recommended because vegetables and fruits is free of fat and cholesterol. Food which is rich of fiber helps digestion. A good digestive system helps reducing the fat, fixing the heart and help fulfilling the nutrition need for metabolism process. Metabolism itself is a very big influence in the combustion process. This diet program is free of salt, because salt that enter the body will bind the water and make it difficult for the body to reissue the water.

Mayo diet has several strengths such as decreasing the body weight, preventing hypertension, keeping the health of the heart, and preventing diabetes (Arsinah, 2017: 1). Mayo diet also has several weaknesses such as excessive dehydration, nausea, easily tired and sleepy. Calory needs for every person is different, sex, age, live style, height and weight has effect towards calory need per day. Calory is measure of the amount of energy contained in food and beverage intake. Man needs 2500 calory per day, while woman needs 2000 calory per day. Principal to decrease the weight is reducing the needs per day. Mayo and keto diet is the diet program to reduce the weight. The amount of calory contained in keto diet is 1400-1600 kcal per day for woman and 1600-1800 kcal per day for man. Mayo diet has calory per day 1200-1400 for woman and 1400-1650 kcal per day for man.

The rapid development of the healthy food culinary business in Yogyakarta with the aim of reducing weight has made people have to be smart to choose whether the diet is suitable and applicable. Dandelion catering established since 2016 in Solo, at first this catering is not focus to healthy food presentment, but seeing the chance exist in Yogyakarta to chance the concept to healthy food for diet. Dandelion catering offers any kinds of healthy food to support diet program, such as *Food combaining*, mayo diet, keto and vegetarian. The amount of calory contained in diet mayo menu that served in the amount of 245-280 kcal per meal for woman and 260-325 kcal per meal for man. Calory within keto diet as much as 225-325 kcal per meals for woman and 355-385 kcal per meals for man.

After the writer doing an interview with the catering owner, the writer interested to conduct the research about 13 days keto and mayo diet program for weight, stomach circumference and fat thickness reduction, because the variety of work and the level of this catering consumer physical activity the writers wants to know which one kind of diet that more suitable for physical activity level of Dandelion catering consumer. Based on the background above, the researcher interested to conduct a research about "The Effect of Mayo

and Keto diet and Physical Activities toward Weight, Abdominal Circumference and Fat Thickness Reduction”

## MATERIAL & METHODOLOGY

### Types of Research

This type of research is an experiment. Experimental research is a research that strictly conducted to know the correlation from cause and effect between variables (Maksum, 2012: 65). One of the characteristics from the experimental research is the existence of treatment which is done to the subject or object of the research. Research design used in this research is factorial experimental research. Design factorial is one of the parts in research that have two or more independent variables that have purpose as learning within independent variable and the existence of interaction in the dependent variable. Factorial design usually used for doing an experiment with two or more independent variables (Maksum, 2012: 99). This experimental research is using 2x3 factorial design.

Table 1. Research Design

Diet / Activity	Keto (A1)	Mayo (A2)
Low (B1)	A1B1	A2B1
Medium (B2)	A1B2	A2B2
High (B3)	A1B3	A2B3

### Research subject

Population in this research contained of 30 people that following the 13 days diet and have job also different physical activity. Sample in this research are the entire Dandelion catering consumer with total of 30 people, starting from senior high school students to house wives.

### Data collection Technique and Instrument

Data collecting technique in this research is using test technique and measurement. Data that obtained in this research are measurement of weight, Abdominal circumference and fat thickness (tricep, subskapul and abdominal) after doing the keto and mayo diet. Instrument used in this research adjusted with need and the research purpose. Therefore this instrument of research is using treatment and measurement instrument.

1. Measurement instrument used weight instrument measurement tool and meter to measure waist circumference.
2. *Skinfold* alat ukur ketebalan lemak. *Skinfold* measurement tool for fat fat thickness.

Measurement of physical activity level used physical activity measurement questionnaire or Global Physical Activity Questionnaire (GPAQ). GPAQ contained of 16 questions that divided into three realms that is physical activity at work, physical activity of travel from one place to other and the activity when in a leisure time or picnic (Hamrik, et. al., 2014: 194). GPAQ had been validated for measurement physical activity from age 16-48 years old (Dugdill, et.al., 2009: 69).

### Data Analysis Technique

Data that obtained will be processed using quantitative descriptive statistics. Data analysis is done through hypothesis test that is normality test, homogeneity test, then hypothesis test. Normality test is used *shapiro-wilk* with significance level of  $\alpha = 0,01$ . Hypothesis test is using T test with significance level of  $\alpha = 0,05$ .

## RESULTS and DISCUSSION

### Results

#### 1. Results of normality and homogeneity test

The normality and homogeneity test is a prerequisite test before conducting a hypothesis test. The normality test uses kolmogrov smirnov and shapiro wilk. Homogeneity tests using levene statistics. Homogeneity and normality test is pre-requirement test before doing the hypothesis test. Normality test using kolmogrov smirnov dan shapiro wilk. Homogeneity test using levene statistic.

##### a. Weight homogeneity and normality test

Table 2. Result of weight normality test

<b>Kelompok</b>	<b>Kolmogrov-smirnov Significant value</b>	<b>Shapiro-wilk Significant value</b>	<b>Distribution of data</b>
Pre A1B1	.161	.168	normal
A1B2	.200	.196	normal
A1B3	.200	.360	normal
A2B1	.200	.238	normal
A2B2	.200	.558	normal
A2B3	.200	.912	normal
Post A1B1	.200	.606	normal
A1B2	.200	.311	normal
A1B3	.200	.332	normal
A2B1	.200	.192	normal
A2B2	.200	.602	normal
A2B3	.200	.439	normal

From table 2 can be seen that when before doing the diet all groups have significance score of  $> 0,05$ , so the distribution is normal.

Table 3. Result of weight homogeneity test

<b>Variabel</b>	<b>Sig</b>
Pre Test	.803
Post Test	.643

Based on the table above explained that entire data before and after done the diet have significance score  $0,803 > 0,05$  and  $0,643 > 0,05$  so all of the data before and after diet comes from the same variant or homogeneous.

**b. Result of Normality and Homogeneity Test of Waist Circumference**

Tabel 4. Result of Normality Test

<b>Kelompok</b>	<b>Kolmogrov-smirnov Significant value</b>	<b>Shapiro-wilk Significant value</b>	<b>Distribution of data</b>
Pre A1B1	.200	.964	normal
A1B2	.200	.274	normal
A1B3	.200	.412	normal
A2B1	.200	.995	normal
A2B2	.037	.058	normal
A2B3	.200	.202	normal
Post A1B1	.200	.866	normal
A1B2	.200	.392	normal
A1B3	.200	.844	normal
A2B1	.200	.942	normal
A2B2	.185	.159	normal
A2B3	.200	.363	normal

From table 4 above can be seen before done the diet all groups have significance score of  $> 0,05$ , so the data distribution is normal.

Table 5. Result of Homogeneity Test

<b>Variable</b>	<b>Sig</b>
Pre Test	.404
Post Test	.200

Table above explained that all of the data before and after done the diet have significance score of  $0,404 > 0,05$  and  $0,200 > 0,05$  so that all of the data comes from the same variant or homogeneous.

**c. The Result of Homogeneity and Normality Test of Waist Circumference**

Table 6. Result of Normality Test

<b>Kelompok</b>	<b>Kolmogrov-smirnov Significant value</b>	<b>Shapiro-wilk Significant value</b>	<b>Distribution of data</b>
Pre A1B1	.200	.314	normal
A1B2	.200	.119	normal
A1B3	.008	.054	normal
A2B1	.200	.119	normal
A2B2	.037	.814	normal
A2B3	.200	.119	normal
Post A1B1	.046	.066	normal
A1B2	.200	.086	normal
A1B3	.200	.814	normal
A2B1	.013	.059	normal
A2B2	.185	.814	normal
A2B3	.200	.086	normal

From table 6 above can be seen that before done the diet all groups have significance score of  $> 0,05$ , so the distribution is normal.

Table 7. Result of Homogeneity test

<b>Variabel</b>	<b>Sig</b>
Pre Test	.937
Post Test	.121

From the table above can be seen that the entire data before and after done the diet have significance score of  $0,937 > 0,05$  dan  $0,121 > 0,05$  so that the entire data come from the same variant or homogeneous.

2. Results of hypothesis test

a. **Weight, Waist Circumference and Fat Thickness Reduction**

Tabel 8. Weight Reduction

<b>Group</b>	<b>Sig</b>
Pre A1B1 – Post A1B1	.031
Pre A1B2 – Post A1B2	.004
Pre A1B3 – Post A1B3	.001
Pre A2B1 – Post A2B1	.013
Pre A2B2 – Post A2B2	.000
Pre A2B3 – Post A2B3	.018

Inf :

A1B1 : low activity Keto

A2B1 : low activity Mayo

A1B2 : Medium activity Keto

A2B2 : medium activity Mayo

A1B3 : High activity Keto

A2B3 : high activity Mayo

Based on table 8 can be seen that when pretest and posttest all of the groups have significance score less than 0,05, where if the significance score lower than 0,05 means there is a different. So for weight reduction have difference before and after diet program.

Table 9. Waist Circumference

<b>Group</b>	<b>Sig</b>
Pre A1B1 – Post A1B1	.005
Pre A1B2 – Post A1B2	.001
Pre A1B3 – Post A1B3	.541
Pre A2B1 – Post A2B1	.005
Pre A2B2 – Post A2B2	.007
Pre A2B3 – Post A2B3	.000

Based on table 9 above there are 5 groups that have significance score less than 0,05, while one group have significance score of  $0,541 > 0,05$ . So for waist circumference reduction can be explained some groups experience the different before and after diet program, but there is one group that not experience the different.

Table 10. Fat Thickness

<b>Group</b>	<b>Sig</b>
Pre A1B1 – Post A1B1	.031
Pre A1B2 – Post A1B2	.004
Pre A1B3 – Post A1B3	.001
Pre A2B1 – Post A2B1	.013
Pre A2B2 – Post A2B2	.000
Pre A2B3 – Post A2B3	.018

Based on the table above all of the groups have significance score less than 0,05. It can be interpreted that all of the groups experience the reduction after diet program.

**b. The effect of physical activity toward weight, waist circumference and fat thickness reduction.**

Table 11. The Effect of Physical Activity Toward Weight, Waist Circumference and Fat Thickness

<b>Activity * Reduction</b>	<b>sig</b>
Weight	.706
Waist Circumference	.631
Fat thickness	.891

It can be seen in table 11, effect of the activity toward weight, waist circumference and fat thickness reduction have significance level above 0,05, so it can be interpreted that between activity and weight, waist circumference and fat thickness reduction have no effect.

**c. Interaction between Diet and Physical Activity.**

Tabel 12. Interaction between Diet and Physical Activity

<b>Diet * Activity</b>	<b>Sig</b>
Weight	.505
Waist circumference	.147
Fat Thickness	.710

Table above explained interaction between diet and physical activity have significance score above 0,05, so it can be concluded that between diet and physical interaction have no interaction.

**Discussion**

The aim of the research is to find out the effect of ket and mayo diet toward weight, waist circumference and fat thickness reduction seeing from physical activity. The main finding within this research is keto and mayo diet can reduce the weight, waist circumference and fat thickness. Mayo and keto diet as good as for weight reduction, there is no effect interaction between diet and physical activities.

**1. Diet keto dan mayo dapat menurunkan berat badan, lingkar pinggang dan ketebalan lemak.**

Both mayo and keto diet capable of reducing the weight, waist circumference and fat thickness. Hidayat, et.al. (2011: 583) stated that the mechanism of weight reduction is induced by loss of energy through excretion of the ketone body, the use of fat and protein in the keto diet to be a major factor in weight reduction. The mayo diet plays a great role in

weight, waist circumference and fat thickness reduction. In Farapti's research (2015: 2)calory within diet mayo as much as  $703,59 \pm 73,95$ , where the normal calory that needs within a day is 1500-1800.

## **2. Aktivitas fisik tidak memiliki pengaruh terhadap penurunan berat badan, lingkar perut dan ketebalan lemak.**

This research classify three kinds of physical activities, low, medium and high physical activity. Those three kind s of physical activities have no effect toward weight, waist circumference and fat thickness reduction, because the reduction of weight, abdominal circumference and fat thickness has an effect when in a diet program.

## **3. There is no interaction between diet program and physical activity toward weight reduction**

In this research shown that between the diet program and physical activity have no interaction toward weight, abdominal circumference and fat thickness reduction. This thing can be concluded that both mayo and keto diet can reduce the weight, abdominal circumference and fat thickness without seeing the consumer physical activity.

## **CONCLUSION**

Based on the research result that have been done, can be cocluded that mayo and keto diet program given by Dandelion catering for 13 days can reduce weight, abdominal circumference and fat thickness to the consumer who have a weight problem. Three physical activities have no effect toward the weight, abdominal circumference and fat thickness reduction. In this research the one which have influence toward the weight, waist circumference and fat thickness reduction is mayo and keto diet program, while the physical activity have no influence toward the weight, waist circumference and fat thickness reduction.

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