



## Original Article

# The Effect Of Intermittent Fasting And Light Physical Activity On Body Weight And Blood Glucose In Overweight Men

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### ABSTRACT

**Background:** Obesity is a global epidemic that can increase metabolic syndrome and insulin resistance risk. Diet modification and light exercise can control metabolism. Intermittent fasting is a time limit for eating, and there are cycles of fasting diets for specific periods. This study aimed to determine the effect of intermittent fasting and light physical activity on body weight and blood glucose in overweight and obese men.

**Methods:** This research method is a Quasi-Experimental study with a Cross-Sectional research design with a sample of 21 men aged 18 to 50 years with BMI > 23 mg/dl and able to participate in the study to completion.

**Results:** The results showed that Alternate Day Fasting and light physical activity can reduce body weight (mean = 84.53) compared to previous body weight (mean = 82.47). There was no difference in blood glucose (Mann Whitney;  $p > 0.05$ ).

**Conclusion:** Intermittent Fasting Diet can reduce body weight but does not cause changes in blood glucose in overweight and obese men.

### INTRODUCTION

Based on data from the World Health Organization in 2016, it is known that more than 1.9 billion adults are overweight. There has been an almost three-fold increase in the prevalence of obesity from 1975 to 2016, consisting of 11% of men and 15% of women.<sup>1</sup> One was carried out to reduce the risk of disease due to obesity, including dietary

modifications and physical activity. Intermittent fasting is a limitation of eating time. There are cycles of fasting diets for specific periods.<sup>2</sup> In addition to losing weight, molecularly intermittent fasting can reduce free radical production. There are changes in adaptive cellular responses that can improve the regulation of blood glucose levels,

increase cell resistance to oxidative stress, and reduce inflammation.<sup>3</sup>

Intermittent Fasting is a dietary modification that limits meal time to 46 hours or extends the night fast from 12 to 18 hours.<sup>4</sup> Diet modifications made during intermittent fasting were in the form of intermittent fasting with an ad libitum diet. During fasting, there is a decrease in blood glucose. This responds to our body to carry out the process of gluconeogenesis. At the beginning of fasting, the breakdown of fat is already visible, while using protein as an energy source is carried out after five days of fasting. This can be seen from the discovery of the presence of urea nitrogen.<sup>2</sup>

Based on research conducted by Antoni R, 2017, intermittent fasting can reduce glucose regulation. In people who fast, there is a decrease in blood glucose, thus causing a reduction in insulin secretion and an increase in the work of glucagon and catecholamines. This glucagon stimulates the breakdown of glycogen in the liver and increases the activity of enzymes for the occurrence of gluconeogenesis from proteins. Glycogen reserves will begin to decrease after a few hours of fasting.<sup>5</sup>

Physical activity and exercise affect human health by influencing energy metabolism, building muscle mass, reducing fat mass, and maintaining bone density. In people who are obese, exercise can significantly reduce belly fat. This reduction in abdominal fat in obese patients is essential because central obesity is a marker for the presence of functional adipose tissue (adiposopathy).<sup>6</sup>

## METHOD

The type of research used in this research is Quasi Experiment with a Cross-Sectional research design. The cross-sectional study design serves to identify the effect of intermittent fasting and light physical activity on body weight and blood glucose levels in overweight and obese men.

The research was conducted in Jambi City and Jambi Province Health Laboratory

Center as a place to check blood glucose levels. As for the inclusion criteria, namely, men aged 18 to 50 years with excess body weight (BMI > 23 mg/dl) and willing to follow the research instructions. As well as the exclusion criteria, namely not participating in the study to completion and having a history of other diseases (diabetes mellitus, heart disease, kidney, and stroke). The procedure of this research, namely as follows:

1. Study participants did an intermittent fasting diet, namely fasting two times a week, Mondays and Thursdays, and doing light physical activity according to the sports instructor's directions for one month
2. Examination of blood glucose levels before and after treatment.
3. Weighing, measuring height, waist circumference, and blood pressure daily for one month.

## RESULT AND DISCUSSION

In this research, 23 obese and overweight men were willing and met the inclusion criteria as the study sample. However, two models were excluded because they needed help to complete the research. The description of the characteristics of body weight from the study, namely:

### Assessment of Body Mass Index

Body Mass Index is a method used to determine a person's nutritional status, which is simple and easy. However, the body mass index assessment cannot directly select a person's body fat. Body mass index is assessed by measuring body weight in kilograms divided by the square of a person's height in meters. In this study, body weight was measured once every three days, and height measurements were taken the first time the study was conducted. The results of the body mass index in overweight and obese men before and after the intermittent fasting diet and light physical activity are as follows

**Table 1.**

**Table 1.** Assessment of Body Mass Index

BMI Before Treatmen	n	BMI After Treatment	n
Obesity Type 1	15	Overweight	2
Obesity Type 2	6	Obesity Type 1	16
		Obesity Type 2	3
TOTAL	21		21

Based on Table 1.1, it is known that there was a change in the classification of body mass index before and after the intermittent fasting diet treatment in overweight and obese men. In this study, it was known that before the intermittent fasting diet and light physical activity, it was known that 15 people had type 1 obesity (BMI = 25-29.9), and six people were obese with type 2 (IMT $\geq$ 30). After intermittent fasting diet and light physical activity for one month, it was found that there was a change in the classification of body mass index obtained, namely overweight (BMI = 23-24.9) in 2

people, type 1 obesity (BMI = 25-29.9) 16 people and obesity type 2 as many as three people. This change in body mass index occurred due to a decrease in the body weight of the study sample.

### Weight Value

In this study, body weight was measured every three days. Based on weighing before and after the intermittent fasting diet and light physical activity, it is known that the average body weight of the research sample is as follows **Table 2.**

**Table 2.** Body Weight Values Before And After The Intermittent Fasting Diet And Light Physical Activity

Before Treatment (kg)	After Treatment (kg)	Correlation	Sig ( <i>p-Value</i> )*
84,47	82,57	0,985	0,000

\*= *t-test*

Based on Table 2, it is known that there was a decrease in the average body weight of the study sample. The average body weight before treatment was 82.57 kg, and the body weight after intermittent fasting and light physical activity was 84.47 kg. Table 2 above shows a strong relationship between body weight before and after the study (correlation 0.985) and a significant relationship between

body weight before and after the study, namely p value = 0.000.

### Blood Glucose Value

This study examined fasting blood glucose before and after completing the intermittent fasting diet and light physical activity. The fasting blood glucose values before and after treatment in the research sample are as follows **Table 3.**

**Table 3.** Blood Glucose Values Before and After the Intermittent Fasting Diet and Light Physical Activity

Before Treatment (kg)	After Treatment (kg)	Correlation	Sig ( <i>p-Value</i> )*
90,71	92,76	0,451	0,04

\*=*t-test*

Based on blood glucose measurements before and after the study in patients, it was found that the average blood glucose value was 90.71 mg/dl. After intermittent fasting, it was found that there was an increase in blood glucose levels, namely 92.76 mg/dl. From Table 3, it is known that there is no significant relationship between blood glucose before and after the intermittent fasting diet and light physical activity.

Based on the study by Patterson and Sea (2017), intermittent fasting was carried out on humans by testing the three methods of intermittent fasting diets. Inflammation. This shows that intermittent diets have been shown to reduce body weight and glucose levels in both animals and humans.<sup>7</sup>

The body needs energy to support internal and external activities. Energy sources are obtained from the metabolism of food ingredients that contain carbohydrates, fats, and proteins.<sup>8</sup> The energy produced will meet the needs in basal conditions and during activities. When there is an excess intake of energy sources, the body's weight will increase because the extra energy will be stored in the body as an energy reserve, especially in the form of fat. When there is a shortage of energy sources for a long time or fasting, fat reserves will be dismantled and converted into energy so that weight loss can occur. For this reason, this intermittent fasting diet and light physical activity can help you lose weight.<sup>9</sup>

Studies in animals and humans have shown that intermittent fasting has health benefits. Intermittent fasting can not

only reduce the production of free radicals and weight loss. But intermittent fasting can also cause changes in adaptive cellular responses that are integrated into organs related to improving the regulation of glucose levels, increasing stress resistance, and playing a role in reducing inflammation. During fasting, cells activate pathways that increase defense against oxidative stress and metabolism that removes or repairs damaged molecules.<sup>3</sup>

A study by Maarten (2015) compared the effects of intermittent fasting and a standard diet for two weeks with eight lean healthy volunteers in a crossover design. There were no differences in body weight between the intermittent fasting and traditional diet groups; peripheral glucose absorption and hepatic insulin sensitivity were significantly different.<sup>2</sup>

## CONCLUSION

In this study, it can be concluded that intermittent fasting diets carried out for one month can reduce the weight of obese and overweight men but do not have a significant relationship with changes in blood glucose levels (p-value = 0.04).

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