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Original Article

A Comparison Between The 5:2 And 16:8 Intermittent Fasting Methods on Weight Loss in Overweight And Obese Individuals

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ABSTRACT

Background: Overweight and obesity are conditions characterized by excess body weight, which increase the risk of chronic diseases. One of the main contributing factors is dietary habits. A popular intervention for weight loss is the Intermittent Fasting (IF) diet, particularly the 5:2 and 16:8 methods. This study aims to compare the effectiveness of the 5:2 and 16:8 IF methods in reducing body weight among overweight and obese individuals.

Methods: This research employed a pre and post test design involving 50 respondents, divided into two groups, and subjected to a 6-week intervention. Data were analyzed using the Paired Sample T-Test (for IF 5:2), the Wilcoxon Test (for IF 16:8), and the Mann-Whitney Test for comparison between the two groups.

Results: The results showed that the IF 5:2 group experienced an average weight loss of 3.38% ($p < 0.001$), while the IF 16:8 group had a weight loss of 2.28% ($p = 0.000$). The comparison between the two groups yielded a p-value of 0.081.

Conclusion: Both IF methods, 5:2 and 16:8, are effective in significantly reducing body weight. Although the 5:2 method resulted in a greater weight loss, the difference between the two methods was not statistically significant.

INTRODUCTION

Overweight and obesity are global health problems that continue to increase. These conditions are characterized by the excessive accumulation of body fat due to an imbalance between energy intake and expenditure over an extended period of time.[1] According to data from the World Health Organization (WHO) in 2022, more than 2.5 billion adults worldwide were classified as overweight, with over 890 million of them categorized as obese. In Indonesia, the prevalence of overweight is 13.5% and obesity is 28.7%, based on indicators from the National Medium-Term Development Plan (RPJMN) 2015–2019.[2]

Overweight and obesity can be influenced by dietary patterns, physical activity, and individual metabolic conditions. These conditions not only increase the risk of non-communicable diseases such as diabetes, hypertension, cardiovascular disease, and cancer, but also negatively affect mental health, including anxiety and depression.[3] Therefore, efforts to reduce body weight have become a primary focus in the prevention and management of these conditions. One increasingly popular approach to addressing overweight and obesity is Intermittent Fasting (IF).[4]

Intermittent Fasting is an eating pattern that involves limiting food intake to specific time periods, allowing the body to utilize stored energy in the form of fat. There are several IF methods, including Alternate Day Fasting, the 5:2 Diet, and Time-Restricted Feeding (16:8). Among these, the most common and easy-to-follow methods are the 5:2 and 16:8 protocols. In the 5:2 method, individuals restrict their caloric intake to 500–700 calories per day on two non-consecutive days per week, while eating normally on the remaining days. In the 16:8 method, individuals fast for 16 hours a day and eat only within an 8-hour window. Both methods have been found to be effective in promoting weight loss, although results may vary depending on fasting duration, compliance, and individual metabolic responses.[5]

Research comparing the effectiveness of these two methods remains limited, especially within the overweight and obese population in Indonesia. Given the high prevalence of overweight and obesity and the urgent need for effective strategies, this study is essential to evaluate which of the two methods is more efficient in reducing body weight. The findings of this study are expected to contribute to identifying the most appropriate intermittent fasting method for overweight and obese individuals.

METHODS

This study employed an experimental comparative analysis using a pre-post test group design to compare the effectiveness of two Intermittent Fasting (IF) methods 5:2 and 16:8 in reducing body weight among individuals classified as overweight and obese. The study population comprised medical students from the Medical Education Program at the Faculty of Medicine and Health Sciences, Universitas Jambi, who met the criteria for being overweight (BMI ≥ 23 kg/m²) or obese (BMI ≥ 25 kg/m²). A total of 50 participants were selected through consecutive sampling and evenly divided into two groups: IF 5:2 and IF 16:8.

This study received ethical approval from the Health Research Ethics Committee (Komisi Etik Penelitian Kesehatan - KEPK) of the Faculty of Medicine and Health Sciences, Jambi University (ethical clearance number: 2497/UN21.8/PT.01.04/2024). Participants who met the inclusion criteria were required to consent to follow all study procedures, have no chronic illnesses or health conditions that could influence the outcomes, and were not currently undergoing any other dietary or medical treatment programs. The research instruments included a consent form, a digital scale for body weight measurement, and a stadiometer for height measurement. The study procedures consisted of the preparation of instruments, recruitment and enrollment of participants, baseline measurement of characteristics (age, sex, body weight, height, and BMI), orientation on IF procedures, a six-week intervention period, and final outcome measurements. Data were analyzed using paired t-tests for the IF 5:2 group, the Wilcoxon signed-rank test for the IF 16:8 group, and the Mann-Whitney U test to compare results between the two groups.

RESULTS

The data on respondent characteristics show that the majority of participants were female, accounting for 34 individuals (68%), while male participants

totaled 16 individuals (32%). In terms of age distribution, 13 respondents (26%) were 19 years old, 9 respondents (18%) were 20 years old, 21 respondents (42%) were 21 years old, and 7 respondents (14%) were 22 years old. Regarding Body Mass Index (BMI) classification, 13 respondents (26%) were classified as overweight, 22 respondents (44%) as obese class I, and 15 respondents (30%) as obese class II.

Table 1. Respondent Characteristics

Characteristics	Frequency (n=50)	Percentage (%)
Gender		
Male	16	32
Female	34	68
Age		
19 Years Old	13	26
20 Years Old	9	18
21 Years Old	21	42
22 Years Old	7	14
BMI		
Overweight	13	26
Obese Class I	22	44
Obese Class II	15	30

The mean, standard deviation (SD), minimum, maximum, and p-value for body weight in the IF 5:2 group are presented in Table 2. These statistical results are used to assess the difference in body weight before and after the 5:2 intermittent fasting intervention. The average percentage reduction in body weight was 3.38%. Furthermore, according to the paired sample t-test, the significance value for body weight was $p < 0.001$, indicating a statistically significant difference in body weight before and after the 5:2 intermittent fasting intervention over six weeks.

Table 1. Differences in Body Weight Before and After IF 5:2

Variable	Pre-Post	Mean	Standard Deviation	Min	Max	*P value*
Body	Pre	79.90	15.63	54.8	114	<0.001
Weight (kg)	Post	77.20	15.34	54	109.6	

The median, minimum, maximum, and p-value for body weight in the IF 16:8 group are presented in Table 3. These statistical results are used to evaluate the difference in body weight before and after the 16:8 intermittent fasting intervention. The average percentage reduction in body weight was 2.28%. In addition, the Wilcoxon signed-rank test showed a significance value of $p < 0.001$, indicating a statistically significant difference in body weight before and after the 16:8 intermittent fasting intervention over six weeks.

Table 3. Differences in Body Weight Before and After IF 16:8

Variable	Pre-Post	Median	Min	Max	*P Value*
Body	Pre	67	54	118	<0.001
Weight (kg)	Post	64.7	52.3	114.5	

The median, minimum, maximum, and p-value of weight loss differences between the IF 5:2 and IF 16:8 groups are presented in Table 4. These statistical results are used to compare weight loss between the two intermittent fasting groups. Based on the table above, a comparison of weight loss differences was made between the IF 5:2 and IF 16:8 groups. Furthermore, the Mann-Whitney U test showed a significance value of p = 0.081, indicating that there was no statistically significant difference in weight loss between the IF 5:2 and IF 16:8 groups.

Table 4. Comparison of Weight Loss Between IF 5:2 and IF 16:8

Variable	Group	Median	Min	Max	*P value*
Weight	IF 5:2	2.5	1.2	4.4	0.081
Loss (kg)	IF 16:8	2.2	1.7	3	

DISCUSSION

The Effect of Intermittent Fasting 5:2 on Weight Loss

The results of this study indicated a 3.38% reduction in body weight following the implementation of the 5:2 Intermittent Fasting (IF) method. Furthermore, analysis using the paired samples T-Test revealed a statistically significant difference in body weight before and after the fasting period, with a p-value of <0.001. These findings suggest that there was a significant reduction in body weight between the pre- and post-intervention groups over the six-week period.

This result is consistent with a study by Huntari et al. (2023), which demonstrated that the application of the 5:2 IF method had a significant impact on weight loss. The study indicated that individuals who followed this dietary pattern experienced substantial weight reduction over a four-week intervention period, during which participants fasted two days per week and were asked to record their food intake.[6] On fasting days, individuals were permitted to consume only 25% of their total energy requirements, which aligns with the findings reported by Esa et al. (2020).[7]

These findings are further supported by another study conducted by Huntari et al. (2024), which showed an average weight loss of approximately 2.25% using the 5:2 IF intervention, whereas in this study, the average reduction was around 3.38%.[8] In addition to weight loss, the 5:2 IF intervention has also been associated with reductions in systolic blood pressure and creatinine levels among individuals with hypertension, as demonstrated in a study by Huntari et al. (2023).[9] However, research by Ikmal et al. (2023) showed that there was no significant effect of the 5:2 Intermittent Fasting method on urea and creatinine levels in three experimental groups of Wistar rats with a diabetes mellitus model, as evidenced by a p-value > 0.05.[10] Similarly, another study by Huntari et al. (2023) reported no significant decrease in triglyceride levels before and after the 5:2 IF intervention in the treatment group's average triglyceride levels.[11]

In contrast, the 3.38% weight loss observed in this study is somewhat lower than the findings of Dae-Kyu Song et al. (2023), which indicated that a 4–10% reduction in body weight could be induced in obese individuals following the 5:2 IF method over a period of 4 to 24 weeks. This discrepancy may be attributed to differences in the duration of the intervention, as the present study was conducted over a relatively short period of only six weeks. A longer duration may yield more pronounced outcomes, especially when considering the long-term effects of the intervention.[12]

The Effect of Intermittent Fasting 16:8 on Weight Loss

The findings of this study indicate that there was an average weight loss of 2.24% following the implementation of the 16:8

Intermittent Fasting (IF) method. Furthermore, analysis using the paired sample T-Test demonstrated a statistically significant difference in body weight before and after the fasting period, with a p-value of 0.000. Based on these results, it can be concluded that there was a significant reduction in body weight following the 16:8 IF intervention.

This result aligns with the findings of Huntari et al. (2020), which showed that intermittent dietary patterns lasting 16–20 hours can reduce body weight, the risk of metabolic diseases, and insulin resistance. The study indicated that the control group, which followed this dietary regimen, experienced a meaningful weight reduction during a four-week intervention period. During this time, participants fasted two days per week and were instructed to record their food intake. However, no studies have yet confirmed the long-term effects of this form of intermittent fasting.[13]

In addition, Wilkinson et al. (2020) also reported that participants who followed the 16:8 IF method experienced an average weight loss of 1.7% from their initial body weight. However, there were no significant differences in fat mass or other metabolic markers when compared to the control group. This is consistent with the average weight loss of 2.24% found in the current intervention.[14]

Several other studies have been conducted to evaluate this method, with varying results related to weight loss. In a study by Esa et al. (2021), the IF method using time-restricted feeding, specifically the 16:8 IF method, was found to be more effective in reducing body weight compared to alternate-day fasting and modified fasting methods.[15]

Comparison of Intermittent Fasting 5:2 and 16:8 on Weight Loss

The weight loss results obtained after the intervention with the 5:2 IF method and the 16:8 IF method showed differences. However, after conducting the Mann-Whitney statistical test, the p-value = 0.081, which indicates that the difference in weight loss between the 5:2 IF and 16:8 IF methods was not statistically significant. However, when comparing the weight loss between the 5:2 and 16:8 IF methods, the 5:2 IF method showed more significant results with a p-value <0.001, compared to the 16:8 IF method, which had a p-value = 0.000.

As stated in a study conducted by Junren Kang et al. (2022), the effect of weight loss from the 5:2 IF method, implemented over 12 weeks in overweight or obese Chinese patients, shows that the 5:2 IF method was chosen as an appropriate intervention for short-term weight loss. In this 5:2 IF study, 30% of energy requirements were met on fasting days and 70% on non-fasting days. This is in line with the findings of Bowen et al. (2018), who concluded that, in addition to weight loss, calorie restriction has been proven to improve insulin resistance, reduce blood lipids, fasting insulin, and decrease inflammation.[16]

From the data analysis, the comparison between the 5:2 IF group and the 16:8 IF group was not significant. However, there was a noticeable difference between the two groups in terms of weight loss. The 5:2 IF method was proven to be a more effective method for short-term weight loss compared to the 16:8 IF method. This is in line with research conducted by Huntari et al. (2021), which suggests that the 5:2 IF method can be used as a healthy diet method or as a non-pharmacological intervention to prevent the onset of diseases associated with metabolic syndrome, thereby improving quality of life.[17-20]

CONCLUSION

The research demonstrates that participants adhering to either the Intermittent Fasting 5:2 or the 16:8 protocol experienced statistically significant reductions in body weight. While the data suggested a tendency towards greater weight loss with the 5:2 method compared to the 16:8 approach, this observed difference did not reach statistical significance. These findings underscore the potential of both intermittent fasting

strategies for weight management, yet they also highlight important considerations for future research. To gain a clearer understanding of long-term efficacy and potentially observe more substantial weight changes, subsequent studies should consider extending the intervention period, ideally to between 8 and 12 weeks. Furthermore, implementing closer monitoring of dietary adherence and overall eating patterns is recommended, particularly for the 16:8 method which does not inherently restrict calorie intake, to ensure participants maintain healthy nutritional habits. Investigating and systematically documenting any potential side effects arising during the interventions is another crucial area for future work. Finally, expanding the scope of assessment beyond weight loss to include other significant health markers, such as blood glucose levels, cholesterol profiles, and blood pressure measurements, would provide a more comprehensive evaluation of the overall physiological impacts associated with these two popular intermittent fasting methods.

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