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The Effect of HIIT Brisk Walk and Intermittent Fasting Training on Body Composition

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ABSTRACTS

Purpose: Intermittent Fasting is currently a supporting strategy for weight loss that is widely used because indirectly energy needs are obtained from burning fat in the body. The purpose of this study was to evaluate the effect of the combination of Intermittent Fasting with physical activity, researchers used the type of brisk walk exercise in the weight loss program and changes in body composition in each individual.

Materials and Methods: The research method was carried out by conducting an exercise program for 12 periods with measurements of body weight, body mass index, body fat, body water, and visceral fat as the main parameters.

Result: The results showed that the combination of Intermittent Fasting with physical activity, especially brisk walking, had a significant positive impact on weight loss and body composition regulation.

Conclusion: It can be concluded in this study that the combination method of Intermittent Fasting with physical activity is quite good in reducing body weight, body mass index, body fat, body water, and visceral fat.

Keywords: Intermittent fasting; Brisk walk; Overweight; Physical activity; Body weight.

INTRODUCTION

Obesity is a global disease that affects public health and is a challenge to improve health worldwide (Zakaria & Zainal, 2022). According to (Nurcahyo, 2015) a person is said to be obese if their body weight exceeds the relative body weight (BBR) by 120% or body mass index (BMI) of 27. Overweight and obesity are often caused by an imbalance between energy intake and energy expenditure (Risky et al., 2023).

According to the World Health Organization (WHO, 2022) the rate of obesity and overweight in adults (18 years and older) is very high, 2.5 billion adults are overweight, and 890 million of them are obese. According to the Indonesian Ministry of Health, the rate of overweight adults in Indonesia is 13.5%, and 28.7% are obese (BMI≥25). So there is a need for a strategy to reduce overweight and obesity at the adolescent age level.

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In this century, some people are more likely to choose intermittent fasting diets for weight loss (Zakaria & Zainal, 2022). Intermittent fasting is a strategy of regulating between scheduled fasting and eating (Zakaria & Zainal, 2022). Intermittent fasting has been extensively studied and is a popular diet for weight loss, preventing central obesity, improving insulin sensitivity, reducing oxidative stress, and preventing coronary heart disease. (Harahap et al., 2023).

During fasting, the body's metabolism usually slows down so it is recommended to do activities with low to moderate intensity (Puspitawati, 2019). According to (Pane, 2015), exercise can help with weight loss and increase insulin sensitivity thus improving blood sugar control. Even without weight loss, increased insulin sensitivity and reduced blood sugar levels still occur.

One of the exercises that can be done during Intermittent Fasting is HIIT. High-intensity interval training (HIIT) is an exercise consisting of a number of high-intensity cycles of short or medium duration, each cycle separated by periods of rest or low-intensity exercise (Windiastoni, 2017). HIIT has the advantage of burning 9 times more fat than aerobic exercise making it suitable for continuous training (Minerva, 2022). In this study, researchers used the HIIT program Brisk Walk model. This program is a physical exercise that is done by walking quickly but not as fast as running and is done with high intensity.

The urgency of this study is that researchers want to get the results of the analysis of the combination of Intermittent Fasting for 3 weeks with the provision of HIIT training 4 times a week on the components of body fat, body weight, BMI, body water and visceral fat. This is very important to do so that later people can use various physical exercise methods that are safe and accurate in the weight loss process.

The aim of this study was to investigate the relationship between the benefits of Intermittent Fasting and physical exercise as important components in a weight loss program, which is then expected to have an impact on changes in body composition. The novelty in this study is the combination of Intermittent Fasting with physical activity in a weight loss program. Previous research has not discussed much about the combination of physical exercise with Intermittent Fasting, many previous researchers only examined 1 component alone such as the effect of HIIT training on weight loss body fitness according to (Intan s, Doewes M, 2020) and the effect of Intermittent Fasting on body weight by (Harahap et al., 2023)

METHODS

***Study Participants*:** In this study, there were 29 people as research samples with an average age of 19 to 20 years combined into one treatment group.

***Study Organization*:** Designed to perform physical activity in the form of HIIT brisk walk exercise for 30 minutes, 4 times a week, with an intensity of 55-80% of maximum heart rate (DNM). Body composition was measured using a Tanita BC-545N scale. When a person steps on the scale, a weak electric current flows through the person's body. The device measures how fast the electric current flows through the body tissues. Based on these measurements, the device calculates a person's body composition, so Tanita body composition results are usually numbers that represent body composition, such as body weight, BMI, fat percentage, water composition, muscle mass, and body score, bone mass, BMR, metabolic age, and visceral fat.

***Statistical Analysis*:** The descriptive test of this research data is used to determine the characteristics of the sample data and the results. Shapiro-Wilk test to test the normality of the data. Wilcoxon test was used to test the difference between before and after the test for each group.

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The SPSS version 16 application was used to analyze the data. This method can be used to see if there is a change in body composition when doing a 30-minute brisk walking HIIT exercise for 12 meetings.

RESULT

Table 1. Exercise Program

No.	HIIT workout program	Duration	Intensity	Measurement Type
1.	Warm up	10 minutes		
2.	Brisk walk	30 minutes	55-80% (DNM)	Stopwatch
3.	Cooling	10 minutes		

Table 2. Descriptive Statistic

Component Comp. Body		N	MEAN± SD	MIN	MAX	Saphiro-wilk		
						Stats.	df	Sig
Age (Year)		29	18.62±0.49	18	19	.617	29	.000
Height (cm)		29	165.65±7.00	154	186	.953	29	.213
Body Weight (Kg)	Pre	29	62.12±10.42	44	85	.954	29	.228
	Post	29	60.55±9.96	43	82	.964	29	.419
BMI (BW/TB²)	Pre	29	22.67±3.33	17.20	30,2	.964	29	.421
	Post	29	22.15±3.15	16.40	29.40	.966	29	.456
Body fat (%)	Pre	29	20.02±7.44	8.20	38.10	.947	29	.150
	Post	29	18.98±8.51	7.90	41.40	.897	29	.008
Body water (%)	Pre	29	53.88±5.95	40.90	65.60	.964	29	.416
	Post	29	55.21±6.15	41.40	64.30	.961	29	.339
Body Muscle (Kg)	Pre	29	46.72±8.46	32.30	63.10	.962	29	.373
	Post	29	46.46±83.05	32.60	64.40	.972	29	.623
Physical Rating	Pre	29	4.75±1.61	2.00	9.00	.910	29	.017
	Post	29	5.10±1.83	2.00	9.00	.951	29	.189
Bone Mass (Kg)	Pre	29	2.61±.39	1.80	3.40	.976	29	.716
	Post	29	2.60±.38	1.90	3.50	.979	29	.802
BMR (kcal)	Pre	29	1471.72±229.30	1070.00	1957.00	.962	29	.377
	Post	29	1458.72±229.14	1065.00	1964.00	.974	29	.658
Metabolic Age (Lvl)	Pre	29	20.65±4.61	18.00	33.00	.663	29	.000
	Post	29	20.10±4.22	18.00	33.00	.564	29	.000
Viceral Fat (Kg)	Pre	29	4.38±3.03	1.00	11.50	.904	29	.012
	Post	29	3.75±2.80	1.00	11.00	.879	29	.003

Table 3. Paired Sample T Test

BODY COMPOSITION COMPONENTS	SIG
Body Weight (KG) Pre vs Post Weight	.000*
BMI Pre vs BMI Post	.000*
WATER Pre vs WATER Post	.000*
MUSCLE Pre vs MUSCLE POST	.181
Bone Pre vs Bone Post	.283
BMR Pre vs BMR Post	.008

Noted :(*) P value <.005. Hence, there is a difference between Pre and Post

Table 4. Wilcoxon

BODY COMPOSITION COMPONENTS	SIG
Muscle Pre vs Post	.139
Physical Rate Pre vs Post	.074
Viceral Fat Pre vs Post	.000*

Noted :(*) P value <.005. Hence, there is a difference between Pre and Post

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DISCUSSION

The results of this study showed that brisk walk training for 3 weeks had an impact on body composition profiles. The data showed that there were significant differences in body weight, body fat, BMI, body water and visceral fat (Park et al., 2023) which concluded that brisk walk exercise affects body composition. Although the study had a different duration of time in the exercise program performed.

The effect of brisk walk on body weight can be proven in the results of this study, namely with an average pretest of 62.12 kg and a posttest of 60.55 kg with a difference of 1.57 kg and a significant value < (0.05). In this study conducted for 3 weeks, HIIT brisk walk training for 30 minutes showed that weight loss reached 1.02%. Based on the Paired Sample t Test statistical test less than (0.05) indicates that this brisk walk exercise program has an effect on weight loss. This is in line with research conducted by (Ck et al., 2021; Okano et al., n.d.; Sitorus & Pujianto, n.d.; T. Zhang et al., n.d.) which is where brisk walking or brisk walk exercise can reduce body weight. Other research conducted by (Chen et al., 2016) also concluded that brisk walking and strength training for 8 weeks is an appropriate exercise method to reduce several cardiovascular risk factors in overweight and obese people. HIIT brisk walking also has a positive impact on body composition. Therefore, it can be concluded that HIIT brisk walking can be one of the alternatives for obesity control (Liu et al., 2020; Murphy & Hardman, 1998)

Based on the results of research and data analysis on body fat, the average pretest result is 20.02 and posttest is 18.98 with a difference of 1.1 and the results of a significant value < (0.05). In this study conducted for 3 weeks of HIIT briskwalk training for 30 minutes showed that the decrease in body fat or body fat reached 1.05%. Based on the Paired Sample t Test statistical test less than (0.05) indicates that this brisk walk exercise program has an effect on reducing body fat. The effect of HIIT training is that the metabolic rate increases after exercise, varying from 90 minutes to 24 hours because the fat burning process occurs quickly (Taufikkurrachman et al., 2021). As exercise intensity increases, fatty acid mobilization from adipose tissue to the bloodstream decreases. This causes a shift from fat metabolism to carbohydrate metabolism. Therefore, during more intense exercise, the process of carbohydrate breakdown is favored over the process of lipolysis. However, high-intensity exercise such as HIIT releases more energy and thus reduces more body fat (H. Zhang et al., 2017a). This is reinforced by research conducted by (Chen et al., 2016; T. Zhang et al., n.d.) who stated that there was a significant decrease in body fat percentage for the briskwalk group. The results of research conducted by (Ck et al., 2021; Fisher et al., 2015) showed a significant decrease in body fat percentage in overweight and obese men who performed moderate and intense intensity exercise.

Based on the results of research and data analysis on BMI (Body Mass Index), the average results of Pretest 22.67 and Posttest were 22.15 with a difference of 0.52 and the results of a significant value < (0.05 In this study conducted for 3 weeks of HIIT brisk walk training for 30 minutes showed that the BMI decrease reached 1.02%. Based on the Paired Sample t Test statistical test less than (0.05) indicates that this brisk walk exercise program has an effect on reducing body fat. This is related to research (Kaukab, n.d.-a; S Gaur et al., n.d.; Siddqui, 2021) shows that aerobic exercise such as brisk walk is more successful in controlling and reducing Body Mass Index (BMI). Briskwalk exercise, which includes high-intensity exercise, can improve body mass index (BMI), burn calories and fat (Talisa Emberts et al., 2013). (Kaukab, n.d.-a; Rao Melam et

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al., n.d.)has also shown that brisk walk for 45 minutes, 5 days per week for 10 weeks significantly reduces BMI.

Based on the results of research and data analysis on Body water, the average results of Pretest 53.88% and Posttest of 55.21% were obtained with a difference of 1.33% and the results of significant values < (0.05). In this study conducted for 3 weeks of HIIT briskwalk training for 30 minutes to get an increase in Body water by 1.02%. Based on the Paired Sample t Test statistical test less than (0.05) indicates that this brisk walk exercise program has an effect on increasing Body water. This is reinforced by research (Nasim, 2011)that HIIT brisk walk training can significantly affect the increase in body water.

In this study there was also a significant decrease, namely in the value of visceral fat which showed a decrease of around 14.38% in the Pretest value of 4.38 and Posttest 3.75, so that the brisk walk exercise program was quite influential in reducing visceral fat. According to (Irving et al., 2009; H. Zhang et al., 2017b) states that exercising with mild, moderate or high intensity is equally effective in preventing or reducing visceral fat, related to an increase in visceral fat usually occurs in physical inactivity for a long period of time or rarely moving, this is common in adults to middle age. Research conducted by (Chiu et al., 2023) also stated that brisk walking for 12 weeks can significantly reduce visceral fat. Exercise brisk walk can reduce visceral fat significantly in the exercise group (Hong et al., 2014)

CONCLUSION

Based on related research, it can be concluded that the combination of HIIT training, fast walking and intermittent fasting affects body weight, body fat, BMI, body water composition and visceral fat in healthy adolescents. A study measuring the effects of HIIT brisk walking on body weight, body fat, BMI, body water and visceral fat in healthy adolescents found that combining HIIT brisk walking with intermittent fasting resulted in weight loss, decreased body fat, body water stores, improved BMI and reduced visceral fat.

In addition, other researchers who investigated the HIIT results of brisk walking exercise also showed that HIIT brisk walking exercise resulted in weight loss, decreased body fat, and decreased BMI. In addition, brisk walking also has a positive effect on body composition and can be an alternative treatment in obesity.

CONFLICT OF INTEREST

The authors declare that there are no conflicts of interest regarding the publication of this study.

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