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Analysis Of 30 Minute Circuit Training And Walking Exercises Results On Body Components

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ABSTRACT

Background: *This study aims to determine the effectiveness of reducing weight, BMI and fat with fun exercise through circuit training.*

Methods: *This research uses a quantitative approach method. This research was conducted at Surabaya State University on March 15 2024 - April 5 2024. 20 students with an average age of 18 - 20 years participated in this research, they were divided into 2 groups, namely 10 students in the circuit training treatment group and 10 students in the circuit training treatment group. 30 minute walking treatment. Training is carried out within 3 weeks carried out 4 times a week. They carry out physical activity in the form of aerobic exercise which consists of exercise stations, namely between 8-16 exercise stations. The exercise is done by moving from post one to post two until the last post. Body composition was carried out using the Tanita scale measuring instrument version BC-545N. The urgency of this research was carried out because there are many teenagers who are obese in Indonesia.*

Results: *The results of this research were that circuit training, which was carried out 4 times a week, and carried out for 3 weeks, was successful in reducing weight, BMI, and FAT.*

Conclusions: *In conclusion, circuit training and walking for 30 minutes has an effect on reducing body weight, BMI and FAT.*

Keywords: *obesity; weight; circuit training; bmi; fat*

1. Introductions

Obesity is a complex disease characterized by excessive fat deposits which can disrupt health (WHO, 2024). Obesity can occur due to several factors, namely consuming excessive food, and balanced by a lack of physical activity or movement, genetic factors are also one of the causes of obesity. According to (Ministry of Health, 2022), a person can be said to be obese if their body mass index (BMI) is more than 27.

Obesity is a risk factor for several chronic diseases, such as diabetes, heart disease, and also cancer (Mokdad et al., 2003; WHO, 2019; Sugiatmi et al., 2019). Based on data (RISKEDAS, 2018) the prevalence of obese teenagers aged 13-15 years in Indonesia is 20%, while aged 16-18 years is 13.6%. Therefore, obesity is still a dangerous disease in Indonesia and needs to be resolved as soon as possible.

One strategy that can be done to reduce the risk of obesity is to exercise. Exercise can increase muscle mass so that it can reduce fat levels, therefore reducing the risk of obesity in adolescence. Apart from the strategies above, the problem of obesity can also be overcome by adopting a healthy lifestyle and eating habits, as well as sports or physical activity for at least 30 minutes every day (Ministry of Health, 2018).

One sport that is effective in losing weight and increasing muscle mass is circuit training. Circuit training is a form of aerobic exercise which consists of training stations, namely between 8-16 exercise stations. Exercise is

carried out by moving from post one to post two until the last post (Suharjana, 2013:49; Purwanto & Nasrulloh, 2017). Providing weight training can result in an increase in muscle mass (Soethama et al., 2016).

The aim of this research is to determine the effectiveness of circuit training exercises in reducing weight. The urgency of this research is due to the large number of teenagers who are obese in Indonesia (RISKEDAS, 2018). So it is very necessary to create an exercise method to lose weight with fun physical exercises such as circuit training. The novelty of this research is that researchers emphasize circuit training with cardio training.

2. Methods

This research was conducted using a quantitative approach method. This research was conducted at Surabaya State University on March 15 - April 2024. 20 students with an average age of 18 - 20 years participated in the circuit training treatment group and 10 students entered the 30 minute walking treatment group. For 3 weeks, 4 times a week they did physical activity. Body composition was carried out using the Tanita scale measuring instrument version BC-545N.

Before being given each treatment, each sample student will carry out a body weighing test, and several series of physical tests, namely push-ups for 1 minute, T-test run, vertical jump, 600 m sprint, leg dynamometer, and test MFT.

3. Results

Description of Student Data

Table 1. Statistical Description of Circuit Training

No	Body composition profil	Circuit training group					
		Mean±st.deviation		Min	Max	Sig.	
1.	BB Pre Vs BB Post	62.4000±59.7700	11.85430±10.53576	45.10±44.40	81.10±77.30	.496*	.524*
2.	BMI Pre Vs BMI Post	23.6300±22.6000	4.55876±4.32718	18.20±17.40	33.80±32.20	.259*	.348*
3.	Fat Pre Vs Fat Post	22.4400±19.5890	11.60038±11.81704	5.50±6.60	46.40±44.70	.727*	.140*
4.	Water Pre Vs Water Post	54.4000±55.8700	6.47457±6.89751	42.80±42.50	66.60±64.50	.598*	.688*
5.	Muscle Pre Vs Muscle Post	45.1800±45.5800	6.89683±8.17568	32.70±32.50	58.00±57.70	.968*	.769*
6.	Physical Ranting Pre Vs Physical Ranting Post	5.5000±5.3000	1.43372±1.41814	3.00±3.00	8.00±8.00	.876*	.318*
7.	Bone Pre Vs Bone Post	2.6500±2.5800	41700±36148	1.90±1.90	3.40±3.10	.326*	.599*
8.	BMR Pre Vs BMR Post	1446.7000±1441.7000	192.73762±216.93934	1095.00±1089.00	1803.00±1783.00	.912*	.477*
9.	Metabolic Age Pre Vs Metabolic Age Post	20.8000±20.4000	5.20256±5.25357	18.00±18.00	34.00±34.00	.000	.000
10	Visceral fat Pre Vs Visceral fat Post	4.4000±4.1500	3.15172±2.97256	1.00±1.00	9.50±9.00	.217*	.166*

Note: The * sign indicates that the data is normal because P > 0.05

Statistical Description of Road Groups

Table 2. Statistical Description of road groups

No	Body composition profil	Circuit training group				
		Mean±st.deviation	Min	Max	Sig.	
1.	BB Pre Vs BB Post	56.6200□55 4.8900	6.7446 8□6.480 99	43.10□ 42.40	64.9 0□63 .60	.093 *
2.	BMI Pre Vs BMI Post	20.6700□20 .1800	1.6275 7□1.526 65	17.50□ 17.60	22.8 0□22 .50	.778 *
3.	Fat Pre Vs Fat Post	17.7000□16 .8800	8.5671 2□7.812 50	6.50□6. 90	27.2 0□26 .60	.032
4.	Water Pre Vs Water Post	56.8400□57 .4300	6.3034 7□6.004 90	49.90□ 51.00	65.7 0□67 .10	.056 *
5.	Muscle Pre Vs Muscle Post	44.1800□43 .1800	7.2748 9□6.674 13	30.00□ 30.10	51.6 0□49 .70	.069 *
6.	Physical Ranting Pre Vs Physical Ranting Post	5.7000□5.6 000	1.4181 4□1.505 55	4.00□4. 00	8.00 □8.0 0	.005

Note: The * sign indicates that the data is normal because P > 0.05

Physical Training Progam

Table 3. Physical training program

Training componen	Circuit Training (Push Up, Squad, Cruch Perut, Lungles, Superman Exercise, Leg Exercise)	Walk
Duration	30 Menit	30 Menit
Intensity	Medium	Low
Type of movement	(Push Up, Squad, Stomach Cruch, Lungles, Superman Exercise, Leg Exercise)	Walk

Descriptive tests were used in this research to explain the profiles of students from both groups. The data normality test was carried out to see the normality of the data in the two groups. Next, an independent sample t test will be carried out to see the differences in training results in the two groups. The paired sample t test was used to see pre and post differences in each group. The entire statistical test process uses the SPSS version 16 application.

Table 4. Normality Test

Body Compotition Components	Stats.		df		Sig.	
	Circuit	Control	Circuit	Control	Circuit	Control
Weight (Kg) Pre	.935	.867	10	10	.496*	.093*
Weight (Kg) Post	.937	.912	10	10	.524*	.295*
BMI Pre	.907	.959	10	10	.259*	.778*
BMI Post	.919	.978	10	10	.348*	.952*
Fat Pre	.955	.829	10	10	.727*	.032
Fat Post	.883	.862	10	10	.140*	.080*
Water Pre	.944	.849	10	10	.598*	.056*
Water Post	.952	.890	10	10	.688*	.172*
Muscle Pre	.980	.856	10	10	.968*	.069*
Muscle Post	.958	.812	10	10	.769*	.020
Physical Ranting Pre	.968	.761	10	10	.876*	.005
Physical Ranting Post	.915	.800	10	10	.318*	.014
Bone Pre	.921	.818	10	10	.326*	.024
Bone Post	.944	.768	10	10	.599*	.006
BMR Pre	.972	.809	10	10	.912*	.019
BMR Post	.933	.746	10	10	.477*	.003
Metabolic Age Pre	.638	.366	10	10	.000	.000
Metabolic Age Post	.551		10		.000	
Visceral Fat Pre	.900	.806	10	10	.217*	.017
Visceral Fat Post	.889	.589	10	10	.166*	.000

Note: The * sign indicates that the data is normal because P > 0.05

Fat Pre tim control, Muscle Post tim control, Physical Ranting Pre tim control, Physical Ranting Post tim control, Bone Pre tim control, Bone Post tim control, BMR Pre tim control, BMR Post tim control, Metabolic Age Pre tim circuit training dan tim control, Metabolic Age Post tim circuit training dan tim control, Visceral Fat Pre tim control, Visceral Fat Post tim control shows in the data that it is not normal because P < 0,05. Meanwhile, other datas (that has the * symbol) shows that it is normal because P > 0,05.

Paired Sample T Test

Circuit Training

Table 5. Paired Sample T Test Group Circuit Training

No	Body Compotition Profile	Group Training Circuit		
		Mean	St. Deviation	Sig.
1.	Weight Pre Vs Weight Post	2.63000	.98523	.026*
2.	BMI Pre Vs BMI Post	1.03000	.83540	.004*
3.	Fat Pre Vs Fat Post	2.85100	5.01575	.106
4.	Water Pre Vs Water Post	-1.47000	3.36123	.200
5.	Muscle Pre Vs Muscle Post	-.40000	3.0493	.688
6.	Physical Ranting Pre Vs Physical Ranting Post	.20000	.42164	.168
7.	Bone Pre Vs Bone Post	.07000	.11595	.089
8.	BMR Pre Vs BMR Post	5.00000	54.31186	.778
9.	Visceral fat Pre Vs Visceral fat Post	.25000	.42492	.096

Control

Table 6. Paired Sample T Test Control Group

No	Body Compotition Profile	Control Group		
		Mean	St. Deviation	Sig.
1.	Weight Pre Vs Weight Post	1.73000	.91658	.000*
2.	BMI Pre Vs BMI Post	.49000	.44585	.007*
3.	Water Pre Vs Water Post	1.49551	.47292	.244

Non-parametric Test

Circuit Training

Table 7. Table Non-parametric Test Group Circuit Training

	BB Post – BB pre	BMI Post – BMI Pre	Water Post – Water Pre	Fat Post – Fat Pre	Muscle Post – Muscle Pre	Physical Ranting Post – Physical Ranting Pre	Bone Post – Bone Pre	BMR Post – BMR Pre	Visceral Fat Post – Visceral Fat Pre
Asymp. Sig.	.005*	.005*	.241	.032*	.528	.157	.084	.314	.096

Note: The * sign indicates that the data is normal because P > 0.05

In the circuit training group there were differences between pre and post in body composition in BMI and fat.

Group Control

Table 8. Table Non-parametric Test group Control

	BB Post – BB pre	BMI Post – BMI Pre	Water Post – Water Pre
Asymp. Sig.	.005*	.016*	.207

Note: The * sign indicates that the data is normal because P > 0.05

In the control group during walking training there were differences between pre and post in body composition in terms of body weight and BMI. So in this study, table 3 shows that there are only indicators or profiles of body weight, BMI, and fat that show differences before and after training for 3 weeks.

Table 9. Table Independent Sample T Test

No	Body Compotition	t	df	Sig.
1.	Weight Post	1.248	18	.228
2.	BMI Post	1.668	18	.113
3.	Fat Post	.605	18	.553
4.	Water Post	-.539	18	.596

Table 4 shows that there is no difference between circuit training and walking training.
Table 9 shows that after training 4 times a week for 3 weeks, it turns out that both exercises gave the same results in body weight, BMI, and fat.

4. Discussion

The same research shows that circuit training can reduce body weight, BMI, and fat. In the same research conducted by (Denny Ramdhanni, 2020) circuit training has a significant effect on reducing body weight and BMI in someone who is obese. Circuit training can prevent obesity because it can affect body weight, BMI and fat. This occurs because circuit training is a combination of resistance and aerobic training (Contro et al, 2017). From several similar studies on circuit training, it turns out that this exercise can help reduce weight, BMI, and fat. So circuit training can reduce the risk of obesity.

In the same research conducted by (Indriani Sekar Arum, 2023) walking can also have an effect on reducing and preventing excess weight gain. Walking exercise can also influence BMI or IMT in reducing the risk of obesity (Suryani, 2020). From several similar studies, it turns out that circuit training and walking can affect the physical components of body weight, BMI and fat.

Circuit training is an alternative exercise model that can be done to lose weight (Pinus, Y, 2022). From several similar studies carried out by several people, circuit training and walking have been proven to influence the reduction of several physical components such as body weight, BMI, and fat.

5. Conclusions

Based on the results and discussion of research regarding circuit training exercises to reduce the risk of obesity. These results can be seen from a decrease in physical components including body weight, BMI, and fat. These results can show that circuit training can be an alternative sport for reducing body weight, BMI, and fat and can be a reference for fitness instructors and sports activists in providing exercise programs.

After looking at the results of the research that has been carried out by the researchers, the suggestions from the researchers are to provide clear direction to the research sample, create a more structured exercise program, emphasize discipline in the sample, make circuit training a possible alternative for losing weight. Can be done sustainably.

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