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The Effect Of Jogging Exercise On Body Composition And Glucose

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ABSTRACTS: *Increased body weight or obesity at the adolescent level is very worrying, this phenomenon also has a significant prevalence in the causes of non-communicable diseases such as heart disease, diabetes, asthma and other diseases. Obesity can occur due to high intake of foods containing fat and sugar which, if not burned or managed by the body, will cause health problems. This study aims to determine the effect of physical activity in the form of 30 minutes of jogging on reducing body composition and glucose. A total of 25 students with an average age of 18-20 years participated in this research. They will do 30 minutes of jogging exercise 4 times a week for 3 weeks. Descriptive tests, normality and difference tests using SPSS 16 were used to explain the research results. The results of this research are p < 0.05, then the data Body Mass Index (IMT), Body Fat, Visceral Fat, Bone Mass, Body Muscle, Physical Rating, Basal Metabolic Rate, and Body Water experienced changes before and after 3 weeks of exercise. These changes show that jogging is good for health. The conclusion of this research is that jogging for 12 times has a significant impact on several components of body composition. Lack of physical activity causes an increase in body composition indicators which has a serious impact on a person's physical health and fitness, jogging is one of the recommended alternatives for keeping the body healthy and fit.*

KEYWORD : ***Body weight, Jogging, Glucose, Body composition.***

1. INTRODUCTION

Obesity is one of the nutritional problems faced by the general public throughout the world. Obesity can occur due to foods that contain high calories and sugar. If the food content is not burned through physical activity, it will be stored in the body as fat, thus affecting health (Arifani & Setiyaningrum, 2021). Obesity is not only about the amount of fat in the body but also the distribution of fat storage which will be stored in adipose tissue under the skin or abdominal cavity (Kusteviani, 2015). Lack of regular physical activity can cause obesity (Sartika, 2011).

According to World Health Organization (WHO, 2022) obesity levels or over weight in people aged 18 years and over is very high, 2.5 billion adults are overweight, and 890 million of them are obese. According to the Indonesian Ministry of Health, the overweight rate among adults in Indonesia is 13.5%, and 28.7% are obese (BMI≥25). For this reason, there is a need for a strategy to reduce obesity in adolescents. Obesity can have a negative impact on glucose levels which can lead to various diseases, so research is needed to determine the level of obesity and glucose levels in students by exercising for 30 minutes of jogging.

Exercise is one of the most appropriate strategies for weight loss. Exercise has been proven to burn calories in the body(Cox, 2017). One sport that is easy to do to lose weight is jogging. Everyone of all ages can jog, so jogging is one of the sports most often done by people.

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If jogging is done regularly, jogging can burn fat and overcome obesity (Santika, 2016). Jogging activities can burn calories and reduce body fat so that it can increase the metabolic ability of cells to absorb and store glucose. The more calories burned by jogging activities can reduce high glucose levels (Sriyono et al., 2023). Burning calories and absorbing good glucose levels in the body can reduce the risk of cholesterol and diabetes.

The urgency of this research is that researchers want to know the results of a 30 minute jogging exercise program on the components of body fat, glucose. This is very important to implement so that people can use various safe and accurate methods or methods to lose weight. The aim of this research is to determine and evaluate the results of a 30 minute jogging exercise for overall body health, especially weight loss. The novelty of this research is that the components are looked at not only from body composition, but also from the glucose levels in the body

2. METHODS

In this study, 25 samples were taken with an average age of 18-20 years. Jogging training is carried out 4 times a week and lasts for 3 weeks. Measuring body composition uses a Tanita scale type BC-545N with the procedure that when the research subject stands on the scale, this tool will measure how fast the electric current flows through body tissue. Based on the results of these measurements, the tool will calculate a person's body composition so that the results Tanita Body Composition usually displayed in the form of numbers that represent body composition such as body weight, BMI, Metabolic Age, Body Fat, Visceral Fat, Bone Mass, Body Muscle, Physical Rating, BMR, and Body Water.

The data tested in this study were body composition and glucose Pretest and Posttest. The descriptive data test in this research was used to determine the characteristics of the sample data and results. The data normality test is carried out via Test Shapiro-Wilk, when value sig < 0.05 then the data is declared normal. Test Paired Sample t Test used when the data is normal, while Test Wilcoxom used when the data is not normal. The SPSS version 16 application was used to analyze the data. Through this method, it can be seen whether doing 30 minutes of jogging exercise can have an effect on body composition and glucose.

3. RESULT

Table 1. Training Exercise

No.	*Training Exercise*	*Duration*	*Intensity*
1	Jogging	30minute	60-80% DNM

Table 2. Descriptive

Component Comp. Body		***N***	***MEAN± SD***	***MIN***	***MAX***	***Sapphire-wilk***		
						stats.	df	Sig
Age (Years)		25	18.80±0.50	18	20	0.667	25	0.000
Body Height (Cm)		25	163.20±6.89	150	180	0.968	25	0.598*
Body Weight (Kg)	Pre	25	55.32±9.02	44.6	86.6	0.828	25	0.001
	Post	25	53.34±8.72	43.4	83.2	0.863	25	0.003
BMI (BB/TB²)	Pre	25	20.84±3.27	16.8	33.4	0.778	25	0.000
	Post	25	20.48±3.50	16	32.1	0.826	25	0.001
Body Fat (%)	Pre	25	23.36±10.10	6.7	46.5	0.933	25	0.102
	Post	25	19.06±10.32	7.1	44.9	0.909	25	0.029

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Body Water (%)	Pre	25	55.31±6.41	40.5	64.2	0.953	25	0.287*
	Post	25	56.38±6.99	41.5	66.6	0.951	25	0.259*
Body Muscle (Kg)	Pre	25	41.65±6.39	32.5	56.7	0.960	25	0.417*
	Post	25	41.51±6.43	31.7	56.3	0.954	25	0.300*
Physical Rating	Pre	25	5.48±1.44	3	8	0.826	25	0.001
	Post	25	6.20±1.60	3	8	0.844	25	0.001
Bone Mass (Kg)	Pre	25	2.43±.32	1.8	3.1	0.977	25	0.831*
	Post	25	2.40±.32	1.8	3.1	0.963	25	0.478*
BMR (kcal)	Pre	25	1327.48±170.75	1097	1735	0.938	25	0.136*
	Post	25	1320.76±168.07	1069	1718	0.939	25	0.141*
Metabolic Age (Lvl)	Pre	25	19.40±3.52	18	34	0.465	25	0.000
	Post	25	19.08±3.42	18	34	0.366	25	0.000
Visceral Fat (Kg)	Pre	25	3.07±2.56	1	10.3	0.779	25	0.000
	Post	25	2.51±2.17	1	9	0.741	25	0.000
Glucose (mg/dL)	Pre	25	92.36±6.39	84	107	0.945	25	0.191*
	Post	25	86.68±7.40	67	99	0.947	25	0.212*

Note: the sign (*) indicates that the data is normal because sig. > 0.05

Tabel 3. Paired Sample Test

BODY COMPONENTS	Sig.
Pre vs Post Glucose	.001*
Water Pre vs Water Post	.000*
Muscle Pre vs Muscle Post	.000*
Bone Pre vs Bone Post	.000*
BMR Pre vs BMR Post	.000*

Note: (*) P value < 0.05 then, there is a difference between pre and post

Table 4. Wilcoxom

BODY COMPONENTS	**Sig.**
Pre vs Post Body Weight	.000*
BMI Pre vs Post	.000*
Physical Rating Pre vs Post	.025*
Metabolic Age Pre vs Post	.066
Visceral Fat Pre vs Post	.002*
Body Fat Pre vs Body Fat Post	.000*

Note: (*) P value < 0.05, so there is a difference between pre and post

4. DISCUSSION

The results of this study show that 30 minutes of jogging exercise for 3 weeks has an impact on body composition and glucose. The data shows that there are significant differences in FAT, body water, muscle, bone mass, BMR, body weight, BMI, physical rating, and visceral fat before and after doing a 30 minute jogging exercise program. There is also a significant difference in glucose levels in the body before and after jogging for 30 minutes, this is proven by the data shown.

The effect of 30 minutes of jogging on body weight can be proven from the results of this study, which are average pretest 55,32 kg and posttest amounting to 53.34 with a difference of 1.98 kg and a sig value < (0.05). In a study of 30 minutes of jogging exercise carried out for 3 weeks, the percentage of

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weight loss reached 3.6%. Based on statistical tests Wilcoxom, A sig value of less than (0.05) indicates that the jogging exercise program has an effect on weight loss. This is also in line with research conducted (Muharramah, 2018) that jogging can reduce weight in teenage students overweight.

Based on the results of research and data analysis on body fat, the average is obtained pretest 23,36 and posttest 19.06 with a difference of 4.3 and a significant value < (0.05). Research on jogging training carried out for 3 weeks showed that the reduction in body fat or body fat levels reached 18.7%. Based on statistical tests Wilcoxom shows sig < (0.05), this shows that the 30 minute jogging exercise program has an effect on reducing body fat. Another study conducted (Juwarni, 2019) showed that the effect of jogging on fat levels among students at Hang Tuah Middle School in Makassar was that on average there was a decrease in fat levels.

Based on the results of research and data analysis on BMI (body mass index), the average is obtained pretest 20,84 and posttest 20.48 with a difference of 0.36 and a significant value < (0.05). In research on jogging exercise carried out for 3 weeks, it shows that the reduction in BMI (body mass index) reached 1.7%. Based on statistical tests Wilcoxom shows sig < (0.05), this shows that the 30 minute jogging exercise program has an effect on reducing BMI.

Research results and data analysis of visceral fat average results were obtained pretest 3.07 and posttest 2.51 with a difference of 0.56 and a significant value < (0.05). In research on jogging exercise carried out for 3 weeks, it shows that there is a decrease visceral fat reached 1.8%. Based on statistical tests Wilcoxom shows sig < (0.05), this shows that the 30 minute jogging exercise program has an effect on the decline visceral fat. Research (Kutac et al., 2023) also states that jogging causes significant changes in body mass, body fat and visceral fat.

Based on the results of research and data analysis on BMR (basal metabolic rate), the average was obtained pretest 1327,48 and posttest 1320.76 with a difference of 6.72 and a significant value < (0.05). Research on jogging exercise carried out for 3 weeks showed that the reduction in BMR (basal metabolic rate) reached 0.5%. Based on statistical tests Paired Sample t Test shows sig < (0.05), this shows that the 30 minute jogging exercise program has an effect on reducing BMR.

Based on the results of research and data analysis of body water average results were obtained pretest 55,31 and posttest 56.38 with an increase of 0.56 and a significant value < (0.05). In research on jogging exercise carried out for 3 weeks, it shows that there is an increase body water reached 1%. Based on statistical tests Paired Sample t Test shows sig < (0.05), this shows that the 30 minute jogging exercise program has an effect on the increase body water.

Research results and data analysis of body muscle and bone mass decrease. Results from average body muscle pretest 41,65 and posttest 41.51 with a difference of 0.14, while the average bone mass pretest 2,43 and posttest 2.40 with a difference of 0.03 and statistical test results Paired Sample t Test shows significance < (0.05).

Based on the results of research and data analysis of glucose average is obtained pretest 92,36 and posttest 86.68 with a difference of 5.68 and a significant value < (0.05). In research on jogging exercise carried out for 3 weeks, it shows that the decrease in BMR (basal metabolic rate) reached 6.1%. Based on statistical tests Paired Sample t Test shows sig < (0.05), this shows that the 30 minute jogging exercise program has an effect on reducing glucose. Likewise, research (Abidin & Kurniawan, 2024) concluded that jogging is a type of exercise that can increase the process of using glucose levels in the blood and then converting it into an energy source by active muscles so that it can reduce glucose levels in the body.

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5. CONCLUSION

Based on the results of data analysis and discussions carried out by researchers, it shows that jogging carried out 4 times a week for 3 weeks not only has an effect on weight loss, but jogging also has an effect on body composition and glucose. Body composition that experiences significant changes such as BMI, Body Fat, Visceral Fat, Bone Mass, Body Muscle, Physical Rating, BMR, and Body Water, where measurements are calculated before jogging and after jogging using a Tanita scale type BC-545N.

REFERENCE

Cox, C. E. (2017). Role of physical activity for weight loss and weight maintenance. *Diabetes Spectrum*, *30*(3), 157–160. https://doi.org/10.2337/ds17-0013

Juwarni, N. (2019). *Pengaruh Jogging Terhadap Kadar Lemak pada Siswa di SMP Hang Tuah Makassar*. 1–16.

Muharramah, A. (2018). *PENGARUH KONSUMSI SARAPAN, ASUPAN ZAT GIZI HARIAN DAN AKTIVITAS FISIK TERHADAP BERAT BADAN PADA REMAJA OVERWEIGHT*.

Abidin, M. Z., & Kurniawan, Y. A. (2024). *work time*. *4*(2), 383–390.

Arifani, S., & Setiyaningrum, Z. (2021). Faktor Perilaku Berisiko yang Berhubungan Dengan Kejadian Obesitas Pada Usia Dewasa di Provinsi Banten Tahun 2018. *Jurnal Kesehatan*, *14*(2), 160–168. https://doi.org/10.23917/jk.v14i2.13738

Jati, R. retno. (2016). No Titleהקיווי ענף: מצב תמונת. *הנוטע עלון*, *66*, 37–39.

Juwarni, N. (2019). *Pengaruh Jogging Terhadap Kadar Lemak pada Siswa di SMP Hang Tuah Makassar*. 1–16.

Kusteviani, F. (2015). Faktor Yang Berhubungan Dengan Obesitas Abdominal. *Jurnal Berkala Epidimiologi*, *3*(1), 45–56.

Kutac, P., Bunc, V., Buzga, M., Krajcigr, M., & Sigmund, M. (2023). The effect of regular running on body weight and fat tissue of individuals aged 18 to 65. *Journal of Physiological Anthropology*, *42*(1), 1–13. https://doi.org/10.1186/s40101-023-00348-x

Muharramah, A., Doewes, M., & Tamtomo, D. (2019). Pengaruh Asupan Gizi Harian dan Jogging Terhadap Perubahan Beat Badan pada Remaja Overweight di Surakarta. *Wellness and Healthy Magazine*, *1*(agustus), 231–237.

Santika, I. G. P. N. A. (2016). I Gusti Putu Ngurah Adi Santika, S.Pd., M.Fis. Fakultas. *Jurnal Pendidikan Kesehatan Rekreasi*, *1*, 89–98. http://download.garuda.ristekdikti.go.id/article.php?article=1500586&val=17887&title=STUDI KELAYAKAN KADAR AIR ABU PROTEIN DAN TIMBAL PB PADA SAYURAN DI PASAR SUNTER JAKARTA UTARA SEBAGAI BAHAN SUPLEMEN MAKANAN

Sartika, R. A. D. (2011). Faktor Risiko Obesitas Pada Anak 5-15 Tahun. *Makara Kesehatan*, *1*(1), 37–43. https://www.academia.edu/17631598/FAKTOR_RISIKO_OBESITAS_PADA_ANAK_5-15_TAHUN

Sriyono, G. H., Hamim, N., & Narsih, U. (2023). Perbedaan Efektivitas Aktivitas Jogging dan Senam Aerobik Terhadap Kadar Gula Darah Sewaktu Pria Remaja. *Jurnal Health Sains*, *4*(1), 74–82. https://doi.org/10.46799/jhs.v4i1.817

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