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Effects of jogging and breakfast consumption on weight changes in overweight high school students at Surakarta-Indonesia



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ABSTRACT

Background: Overweight is a disproportionate nutritional status between intake and energy expenditure that leading such health problems. Its features that arise in adolescence tend to continue in adults and the elderly. Nutritional status in adolescents can indicate the level of dietary issues occur – namely daily intake problems in adolescents in which one of them can be described from breakfast consumption. Fulfillment of intake in those students can affect weight, but other things that need to be considered is about their physical activities such as jogging. Jogging itself is included in cardio exercises (cardiovascular) or often called aerobic exercise. The great benefit of cardio in addition to improving fitness is to increase fat burning in the process of weight loss.

Aim: The study aims to evaluate the effects of jogging and breakfast consumption on the alternation of weight in overweight students.

Methods: This research is a kind of analytical quasi-experimental design with pre-test and post-test control group design. This study was conducted by grouping it into the treatment group and the control group for 12 weeks. The statistical test uses independent samples t-test to compare the average of either jogging and breakfast consumption influenced the weight changes.

Results: The research shows that the body weight changes on the students before and after treatment were differed significantly ($p=0,023$).

Conclusion: There is a difference in the effect of breakfast consumption compared to the setting of breakfast consumption by jogging against weight changes in overweight adolescents.

Keywords: adolescent, nutritional status, breakfast consumption, mild activity

Cite This Article: Muharramah, A., Doewes, M., Tamtomo, D.G. 2018. Effects of jogging and breakfast consumption on weight changes in overweight high school students at Surakarta-Indonesia. *Bali Medical Journal* 7(2): 472-474. DOI:10.15562/bmj.v7i2.1065

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INTRODUCTION

Based on data from the World Health Organization (WHO) 2014, in 2008, the obesity rate in the world was 11.9%, more than 1.4 billion adolescents suffered overweight, and obese people as many as 200 million are male teenagers and 300 million are girls.¹ Overweight is an unbalanced nutritional status due to excessive nutrient intake resulting in an imbalance of energy that can lead to health problems.² It will affect adolescents in their life become less confidence.³ Nutritional status may show the level of daily intake problems in adolescents in which can be described from their amount of breakfast intake consumed. The previous study shows that breakfast is essential for everyone to start their activity along day.⁴ Balanced breakfast consumption aims to meet the needs of nutrients in the morning as part of the fulfillment of nutritional balance as well as provide benefits in preventing hypoglycemia, stabilize blood glucose levels, and avoid dehydration after fasting throughout the night.⁵ Thus, long-term breakfast consumption may be useful in preventing obesity as breakfast habits performed can instill a good diet.⁶

Breakfast must ideally meet 25% of daily needs. Breakfast consumption according to recommended dietary allowance can be determined from the contribution of energy derived from carbohydrate sources. The availability of this nutrient function is essential against physiological processes in the body.⁷ Fulfillment of the intake can affect weight, but other things that need to be considered is about physical exercises such as jogging. Jogging itself involves cardio workouts (cardiovascular) or often called aerobic exercise. The significant benefits of cardio in addition to improving fitness is to increase fat burning in the process of weight loss. According to Suharjana (2013), the most effective type of exercise to lose weight is long-term aerobic workout between 20-60 minutes.⁸ The aerobic capacity itself is affected by the pulse and vital capacity of the lungs. Lower the pulse rate established, better the aerobic capacity will be achieved. Similarly, if it's viewed from the vital capacity of the lungs, higher the capacity, better the aerobic capacity will be conducted.⁹ The study conducted by Arywibowo (2009) express that a decrease of 5-10% body weight

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Received: 2018-02-13

Accepted: 2018-4-15

Published: 2018-5-1

in obese people from the original weight would give significant meaning to their health.¹⁰

METHODS

This research uses a quasi-experimental design with pretest and posttest control group design. The study was conducted in a high school (SMA) located in Surakarta by the purposive method. It was carried

out for 12 weeks in August-September 2017. The population in this study includes high school adolescents who have overweight nutritional status located in three instances, namely SMA Al-Islam 1 Surakarta, SMA MTA Surakarta, SMA Assalam Surakarta, at the age of 15-18 years as many as 158 students. The subjects were divided into 2 groups, such as the control group observed the breakfast consumption among the students as well as the treatment group observed breakfast consumption which was combined with jogging. Samples in each group amounted to 11 subjects. The dependent variable in this research is weight changes in an overweight adolescent. On the other hand, independent one is jogging and breakfast consumption. Data analysis was needed to determine the difference in body weight before and after treatment in each group. The data analysis was performed using the independent samples t-test.

RESULTS

In this study, subjects were 15-18 years old and active in following the process and implementation of jogging. The research has more women as many as 14 people (63.6%) and those who were in an average of 16 years were as many as 10 people (45.5%). According to measurements which were carried out for body height on, subjects who were 161-170 cm in height seems more involved as many as 11 people (50.0%). Besides, the average of body weight approximately 61-70 kg was more detected as many as 11 people (50%).

Table 2 shows the results of weight changes in the subjects at the time before and after treatment in each treatment group. The subjects in the control group before treatment had body weight approximately 72.95 kg in average and their weight gained after the study is 73.47 kg. Whereas in each treatment group before the study had 69.10 kg body weight and lost their weight being approximately 68.15 kilograms on average. Statistical independent samples t-test in table 3 shows the result that there are differences in weight changes in the students during the treatment, both in the treatment group and the control group ($p < 0.05$).

DISCUSSION

The result using independent t-test shows the difference in each group to the changes of body weight on the students, both before and after the treatment for three months. Body weight measurement was conducted once a month to know the existence of their changes. These results indicate that there is a significant difference of weight changes on the

Table 1 Frequency data among the subjects by age, gender, height, and weight

No	Characteristics	n	%
1.	Age		
	15 years	1	4.5
	16 years	10	45.5
	17 years	9	40.9
2.	Gender		
	Male	8	36.4
3.	Body Height		
	≥ 171 cm	3	13.6
	161-170 cm	11	50.0
4.	Body Weight		
	≥ 81 kg	2	9.1
	71-80 kg	8	36.4
	61-70 kg	11	50.0
	≤ 60 kg	1	4.5

Source: Data Primer, 2017

Table 2 Data on body weight among the subjects

Group	n	Changes in Weight			
		Before		After	
		Median (Min-Max)	Means ± SD	Median (Min-Max)	Means ± SD
Control	11	59.90 - 83.00	72.95 - 7.49	61.00 - 84.80	73.47 - 7.42
Treatment	11	63.00 - 75.00	69.10 - 3.47	62.20 - 72.70	68.15 - 3.25

Source: Data Primer, 2017

Table 3 Data tabulation between each group against weight changes per month

Variable	Treatment	Control	P
	Mean ± SD	Mean ± SD	
Weight changes Month-1	69.10 ± 3.47	72.95 ± 1.91	0.033
Weight changes Month-2	68.61 ± 3.26	73.22 ± 7.51	0.029
Weight changes Month-3	68.15 ± 3.25	73.47 ± 7.42	0.023

treatment and control one with p -value = 0.023 ($p < 0.05$). These results may provide different variations due to longtime research – measure body weight every month – to be able to monitor those weight.

Breakfast consumption itself has an impact on nutritional status among children and adolescents about 10-16 years old. Furthermore, regulating breakfast consumption that meets 25% of daily need is an essential part of fulfilling balanced nutrients and habituating own selves to have a proper diet.¹¹ Adequate dietary habits of the students which were suit to adjusted RDA needs can help the regulation of body weight as to lose weight, especially for those who have overweight.¹² Inadequate breakfast consumption or even skip for breakfast can make a person to have an excessive snack during the day or night. Its habits affect a poor diet, so that changes the body weight afterward.

Daily intake regulation in students who are balanced with physical exercise can regulate the calories in their body. Calories derived from the total energy intake that affect body weight and also related to the occurrence of either overweight or obesity. Thus, the low consumption with imbalances in energy absorption and expenditure can be improved by caloric restriction and increased physical activity or exercise as well.¹³ Physical exercise itself given to students is a jogging exercise for 12 weeks – attention with frequency, intensity, and appropriate timing. The quality of our jogging exercises may be identified by paying attention to the pulse rate in the subjects. The ideal pulse rate intensity is 65% -75% of maximal heart rate (MHR) for fat burning and weight loss process.¹⁴ By applying those implementations, they can burn calories that influence the weight loss. Also, physical exercise performed in the form of jogging may progress the decrease in body fat percentage and body weight.¹⁵

CONFLICT OF INTERESTS

Authors in the study state that there is no conflict of interest regards with the research.

CONCLUSION

The results of this study prove that there is a difference in the effect of breakfast consumption

compared with the setting of breakfast consumption by jogging against weight changes in overweight teenagers significantly.

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