

# Aerobic Exercise and Obesity Reduction in Adolescents

Haeslin Joe\*

Editorial Office, Journal of Health and Medical Research, Belgium

## Corresponding Author\*

Haeslin Joe  
 Editorial Office, Journal of Health and Medical Research,  
 Belgium  
 E-mail: healthres@peerjournal.org

**Copyright:** 2022 Joe H. This is an open-access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.

**Received:** 05-Mar-2022, **Manuscript No.** JHMR-22-58536; **Editor assigned:** 07-Mar-2022, **PreQC No.** JHMR-22-58536(PQ); **Reviewed:** 13-Mar-2022, **QC No.** JHMR-22-58536; **Revised:** 20-Mar-2022, **Manuscript No.** JHMR-22-58536(R); **Published:** 27-Mar-2022, DOI: 10.37532/jhmr.2022.4(02).108.

## Abstract

An enhanced ant colony algorithm-oriented aerobic exercise approach was proposed to study the association between youth aerobic exercise and obesity reduction. To begin, changes in body shape, weight, BMI, body fat, body circumference, and other indicators of obese adolescents before and after aerobic exercise were used as the initial pheromone distribution matrix, and the random evolution factor and evolutionary drift threshold were introduced to establish the target function of reducing obesity in adolescents caused by aerobic exercise. The particle algorithm was proposed to construct the best model of aerobic exercise for teenage obesity reduction, and the constraint conditions of the association between aerobic exercise and adolescent obesity reduction. The average modelling error of this method is about 0.053 percent, while the traditional method's average error is about 0.186 percent, indicating that this method can control the error within a reasonable range, and it has been proven that the improved ant colony algorithm can have a good correlation with the method of aerobic exercise.

**Keywords:** • Matrix • Obesity • Aerobic • Cholesterol

## Introduction

Adolescence is the time between the onset of secondary sexual traits and the onset of adult sexual features. Puberty strikes girls between the ages of 11 and 16, and boys between the ages of 6 and 13. People are concerned about teenagers' healthy development. As a result, in order to meet the needs of teenagers in terms of growth and development, it is vital to offer ample nourishment and boost energy consumption. The rise of adolescent obesity has been increasingly serious in recent years, drawing the attention of parents, schools, society, and relevant specialists. According to an expert survey, 12.03% of urban kids are overweight or obese, and this number is rising by 8% per year. Obesity is affecting the health of an increasing number of children and adolescents. Many overweight children have one or more cardiovascular disease risk factors, thus parents and teachers should actively encourage their children to participate in weight-loss activities. Obese teenagers consume too much fat, protein, and carbohydrates, are hesitant to eat vegetables, and have an inconsistent nutrient intake. Many people eat more and move less, resulting in weight increase, which leads to a variety of chronic conditions and puts children's health at risk. Aerobic exercise is regarded as one of the simplest and most effective methods of weight loss. It is a type of physical activity that assists the body in becoming fully oxygenated and achieving physiological balance. Simply described, aerobic exercise is any rhythmic movement that lasts for a long time (approximately 15 minutes or more) and is of a light to moderate intensity (75% to 80% maximum heart rate). Walking, jogging, swimming, running, aerobics, cycling, climbing, jumping rope, basketball, football, and other typical aerobic exercise forms are the most essential aerobic training in sports. Aerobic exercise is used to increase cardiorespiratory endurance. It undertook a rational analysis of the questionnaire survey findings and conducted an experimental comparison of 100 students before and after learning aerobics for a year.

The 100 students were slightly obese before aerobics training, with an average body fat of 32.1% after a year of aerobics instruction, they had reached the standard level. Their body fat percentage decreased by 6% to 26.1% on average.

Before exercise, about 50 students were above the normal standard and exercised lightly for fueling posture; after exercise, 90% of them were standard type, and the average body fat volume decreased from 15 kg before exercise to 12.5 kg after exercise, with each person's average fat volume decreasing by 2.5 kg. The acquisition of teens suffering from diverse obesity factors is the first step in the association between aerobic exercise and adolescent obesity reduction process. Then, for the association between adolescent obesity and aerobic exercise, compute the weights of various components on the adolescent health damage coefficient and set up an aerobics constraint model. The effect of aerobic exercise on the link between teenage obesity and the reduction of limitations is discussed. Calculate the objective function, which will be utilised to solve and create the problem model. The ant colony algorithm is used to converge the changes in body shape, weight, BMI, body fat, body circumference, and other indicators of obese adolescents before and after aerobic exercise as the initial pheromone distribution matrix in the optimization modelling process of adolescent obesity aerobic exercise reduction, and then the random drift progression factor and evolution threshold are introduced to establish the objective function. It also outlines the constraints that must be met in order for aerobic exercise to be effective in lowering the link between obesity and adolescent obesity.

It is thought that this depicts the change factors of obese adolescents' body shape information before and after aerobic exercise. This indicates the impact of obesity on teenagers' activity levels, and B represents the change variables in obese adolescents' BMI index before and after aerobic exercise. The experiment's participants were young people who actively engaged in aerobic activity in order to lose weight. A total of 60 obese adolescents, ranging in age from 14 to 19, including 30 boys and 30 girls, received 6 weeks of low-intensity long-term aerobic exercise. Before the experiment, the parents of the subjects had to complete an informed permission form. The four blood lipids that are examined by enzyme technique are High-Density Lipoprotein Cholesterol (HDL-C), Low-Density Lipoprotein Cholesterol (LDL-C), Total Cholesterol (TC), and Triglyceride (TG).

A new aerobic exercise method based on an ant colony algorithm was proposed. The resulting index changes were essentially consistent with the real value in the examination of obese adolescents' index changes before and after aerobic activity, but there was a considerable difference between the traditional approach and the actual value. The proposed method has an average error of 0.053%, while the standard method has an average error of 0.186%. It demonstrates that the proposed technique can keep the error within a reasonable range, and that the aerobic exercise method of the improved ant colony algorithm can adequately explain the relationship between the two.

There are numerous types of aerobic exercise. In general, it is done at a moderate intensity for a long period of time. Running a long distance at a reasonable speed, for example, is an aerobic activity, whereas sprinting is not. Singles tennis with near-continuous mobility is considered aerobic activity, whereas activities with brief bursts of vigorous movement among longer periods of casual movement are not. Some sports are inherently "aerobic," while others, like fartlek training or aerobic dance classes, are explicitly designed to promote aerobic capacity and fitness. Aerobic workouts that primarily or completely involve the leg muscles are the most common. There are a few exceptions to this rule. Rowing for 2,000 metres or more, for example, is an aerobic sport that works numerous major muscular groups, including the legs, abdominals, chest, and arms.

The purpose of this study is to provide information on an easily administered exercise test that is appropriate for the fitness programme. For assessing aerobic training benefits, formal laboratory-based exercise tests with on-line analysis of expired air are regarded the gold standard. These tests, however, are time-consuming and costly, and the specialist equipment necessary is not readily available. Furthermore, many obese people find these tests to be quite stressful and are hesitant to do them on a regular basis. As a result, a simple and effective approach of assessing aerobic fitness in obese adolescents is required. A test should be incremental and progressive in character, stressing the patient to a symptom-limited

maximum performance for this purpose. The 12-minute walk/run is a self-paced test that is susceptible to incentive. Throughout the test, the subject sets the pace. This increases the chances of not reaching maximum cardiorespiratory values. Obese children patients were recruited from Hilversum's Treatment Center Heideheuvel's paediatric department. Children aged 10-18 years with obesity (BMI = 30) who were sent to a multidisciplinary body weight management programme met the inclusion criteria. Musculoskeletal problems are an exclusion criterion. The inclusion criteria were met by fifteen patients in a row. Everyone consented to take part in the aerobics study. The children who took part in the aerobic training study were all first-time patients. The study protocol (protein-sparing diet), exercise, and family-based treatments, medical therapy in the event of problems, and behaviour change are all part of the multidisciplinary body weight control approach.

The Schofield-formula was used to calculate each child's calorie requirements, assuming a P50 weight for length. As a result, calorie restriction is only allowed if the child's weight surpasses this threshold. The treatment program's guiding idea is that both the kid and his or her parents must learn to adapt to a new dietary pattern (in terms of content, composition, preparation, and so on) that can be maintained after the desired weight loss has been achieved.

Our aerobic fitness programme is part of a larger effort to create an effective juvenile body weight management programme. protocol was approved by the local institutional Ethics Committee.

Triathlon: Afterwards, exercise on a regular bicycle or a mountain bike, as well as a kick board, followed by swimming. If this was too tough (primarily due to body bulk), the participants might utilise a home trainer (indoor) instead of a bicycle/mountain bike, and/or walk instead of utilising the kick board. This distinction is primarily based on body mass. 12 minutes of cycling, 12 minutes of kickboarding or walking; no pause between cycling and kickboarding or walking.

In 12-15 minute sports game with two teams and customised regulations to ensure a sufficient and considerable aerobic workout. A typical progressive incremental exercise test was used to determine aerobic fitness. At 1-minute intervals, the workload was raised by 20 W. The highest exertion maintained for 30 seconds was determined as the maximal workload (Wmax). With a triple V valveless mouthpiece, continuous respiratory gas analysis and volume measurements, oxygen uptake (VO<sub>2</sub>), and carbon dioxide generation (VCO<sub>2</sub>) were done breathe by breath and saved in a computerised exercise system (Oxycon Champion, Jaeger, Breda, The Netherlands). Internal gas and volume calibrations were performed before to each test using certified gases with established standard concentrations. During the testing, a 3-lead electrocardiogram (Hewlett-Packard, Amstelveen) was used to continually monitor heart rate. The data is presented as a mean standard deviation. A two-tailed paired t-test was used to examine changes within the aerobic activity group. The modified shuttle

test with aerobic markers was subjected to Pearson correlation and linear regression analyses. The Statistical Package for the Social Sciences was used to examine the data.

The MST's construct validity was determined by comparing it to a gold standard: peak oxygen uptake during a progressive incremental exercise test. Correlations were calculated between the MST walking distance and aerobic indicators.

## References

1. Brooks BR, Miller RG, Swash M, et al. Escorial revisited: revised criteria for the diagnosis of amyotrophic lateral sclerosis. *Amyotroph Lateral Scler Other Mot Neuron Disord.* 2000;1(5):293-299.
2. Ludolph A, Drory V, Hardiman O, et al. WFN research group on ALS/MND. A revision of the el escorial criteria-2015. *Amy Lat Scler Front Degener.* 2015;16(5-6):291-292.
3. Grimm A, Prell T, Décard BF, et al. Muscle ultrasonography as an additional diagnostic tool for the diagnosis of amyotrophic lateral sclerosis. *Clin Neurophysiol.* 2015;126(4):820-827.
4. Boekestein WA, Misawa S, Schelhaas HJ, et al. Ultrasonographic Detection of Fasciculations Markedly Increases Diagnostic Sensitivity of ALS. *Neurology.* 2012;77(16):370-371.
5. O'gorman CM, Weikamp JG, Baria M, et al. Detecting fasciculations in cranial nerve innervated muscles with ultrasound in amyotrophic lateral sclerosis. *Muscle & nerve.* 2017;56(6):1072-1076.
6. Misawa S, Noto Y, Shibuya K, et al. Ultrasonographic detection of fasciculations markedly increases diagnostic sensitivity of ALS. *Neurology.* 2011;77(16):1532-1537.