

## Effect of 12 Minute Walk/Run Test on Overweight Healthy Collegiate Population

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### ABSTRACT

**Background of Study:** Excessive accumulation of fat in the body considered as overweight, which can be assessed by Body mass index. In overweight individuals the aerobic capacity is relatively less, when compared to normal weight individuals. 12-minute walk test is a very useful and reliable assessment tool for the evaluation of aerobic fitness and capacity on overweight healthy population.

**Objective:** To analyze the effect of 12-minute walk test on overweight healthy collegiate population, thereby to understand the aerobic fitness of these subjects using max.

**Methods:** This experimental study was conducted on 20 subjects including 18 females and 2 males, within the age group 18 to 25 years. Height and weight of the subjects were taken and their body mass was analyzed using BMI. Aerobic fitness of the subjects can be evaluated by 12-minute walk test (COOPER TEST).

Distance traveled with 12 minutes was recorded and their VO<sub>2</sub> max was also calculated.

**Result:** The mean and standard deviation for BMI is  $26.435 \pm 1.045$  and for 12-minute walk/ run test is  $1848.25 \pm 193.5$ . The mean and standard deviation for VO<sub>2</sub> max is  $29.319 \pm 4.32$ . When the BMI increases, aerobic endurance in those individuals become also higher accordingly.

**Conclusion:** The overweight participants become weaker when they completed overweight. When compared to normal weight pupils, overweight individuals had worse aerobic fitness and capacity with a close association of the variables. The study concluded that there will be significant effect of 12-minute walk/ run test on overweight healthy collegiate population.

**Key words:** Overweight, BMI, Cooper's 12-minute walk/ run test, Physical activity

## INTRODUCTION

### Background of Study

The term, “Overweight” refers to the weight of the body which is more than that considered as ideal for certain height<sup>[1]</sup>. It occurs reportedly because of excess body fat accumulation and may also be due to extra muscle mass, bone, or water. It is leading to adverse effects on health and life expectancy<sup>[2]</sup>.

Body Mass metric (BMI) is a simple weight-for-height metric that is commonly used to assess adult obesity. It can be measured by an individual’s weight in kilograms divided by square of height in meters ( $\text{kg/m}^2$ )<sup>[3]</sup>. World Health Organization (WHO) defines that, a BMI greater than or equal to 25 reports to overweight, in adults<sup>[4]</sup>.

Globally, as much as 1.9 billion adults aged 18 and above were determined to be overweight, accounting to 39% of the adult population in which 39% of men and 40% of women. In 2016, approximately 13% of the population was obese, with 11% of men and 15% of women being obese. The 2017 -18 data of National Health and Nutrition Examination Survey (NHANES), states that 30.7% of adult population are overweight and 42.4% are obesity. About 1 in 3 men (34.1%) and 1 in 4 women (27.5%) are identified as overweight<sup>[4]</sup>.

There are numerous elements that can workup to excess gain in weight among adults, including the amount, type of foods and beverages consumed, genetics, level of physical activity, sleep habits, sedentary lifestyles such as watching television, using mobile phones and computers, and secondary diseases<sup>[1]</sup>. An array of negative experiences may be encountered by the collegiate population who are healthy overweighted including discrimination, teasing, bullying, and social isolation<sup>[7,8]</sup>. This may lead to self-consciousness’ and body dissatisfaction in them<sup>[9]</sup>.

Following regular physical activity, sleep routine and a healthy eating plan, that includes; vegetables, fruits, whole wheat bread and grains such as, oats and brown rice, low fat dairy products, and a variety of protein foods can help to reduce weight gain<sup>[10]</sup>. Physical activity, in conjunction with diet, treatment of associated health conditions, and behavioral support, is seen as an important component of the management of overweight in individuals<sup>[14]</sup>. Utilizing the existing energy and burning out the calories is termed as the ideal physical activity. Physical activity, in conjunction with diet, treatment of associated health conditions, and behavioral support, is seen as an important component of the management of overweight in individuals<sup>[14]</sup>. A positive outlook on the mental stability can be boosted upon by keeping a track on regular exercise regimen over time accounting to reduced depression and mood swings<sup>[17]</sup>.

Aerobic activities are a group of physical workouts used to lose excess body weight. Aerobic exercise training can help overweight college students enhance their lung function by strengthening their respiratory muscles<sup>[18]</sup>. It can also result in inclining the  $\text{VO}_2$  max together with an improvement in cardiac contributions. This may assist to prevent the occurrence of cardiovascular disease in obese people<sup>[19]</sup>.

The 12-minute walk test, also known as Cooper Test was described by Dr. Kenneth Cooper, MD (in 1968)<sup>[13]</sup> is a very easy way to measure an individual’s aerobic fitness, sustenance and a predictive test of  $\text{VO}_2$  max. It is found that the distance that a person can walk or run in 12 minutes and the  $\text{VO}_2$  max value could co-relate with the efficiency of someone can use oxygen while exercising are highly correlated<sup>[14]</sup>. Physical fitness and aerobic capacity of overweight healthy collegiate students will be assessed by the 12-minute walk/ run test<sup>[15]</sup>.

Among college population, chance of being overweight is most often higher. It is because of students are very lazy about doing physical activities. Adding together are excess consumption of high calorie foods, abnormal eating schedules, poor meal choices and also their higher stress levels are more prone to be the cause of overweight <sup>[20]</sup>. Aerobic capacity in these subjects has been reduced when compared to normal individuals <sup>[21]</sup>. This research, focused to understand the effect of 12-minute walk test on overweight college students and there by assess their aerobic fitness, in comparison with normal weight students.

## METHODOLOGY

Students from KMCT College of Allied Health Sciences were invited to participate in this study. After obtaining the informed consent out of 320 students, started to evaluate BMI of those participants. In particular, the height was measured by a fixed Stadiometer and weight was measured using weighing machine. Out of 320 students, 20 students of both genders are overweight and selected for this study. Following the approval of the Institutional ethical committee, these 20 students were studied for a period of six months. Subjects of both genders, between the age 18- 25 years, who were overweight on the BMI measure, and who lacked the exposure to physical activities were selected. Consent was obtained, by explaining the aim and outcome of this research.

The aerobic fitness of these participants was assessed by Cooper's 12-minute walk test, since is safe, easy, short, and administrable with the minimal and cheap amount of equipment's. This test is largely used in field session of training, during valid and reliable estimation of cardio vascular fitness, endurance and aerobic power ( $\text{VO}_2$  Max). Cooper's 12 min walk test was performed on a clinical setting. Marking cones, recording sheets and stop watch were needed to do the procedure. Markers were strategically put throughout the floor to aid in measuring completed distance. Prior to taking the exam, the subjects were given a warm-up. Jogging or vigorous stretching for 5-10 minutes. The participants then walked for 12 minutes at their own pace, and the total distance completed was recorded.

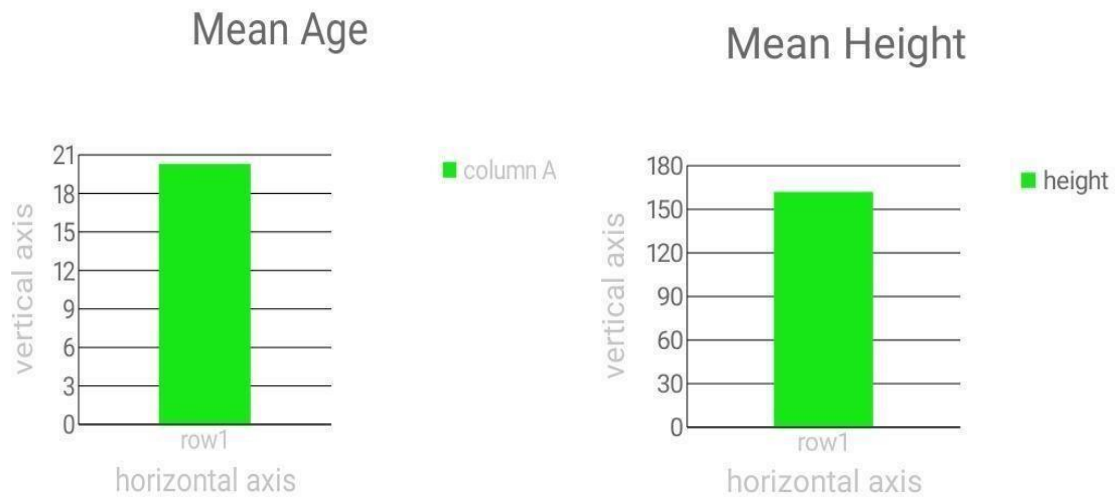
### Data Analysis and Interpretation

This research involved 20 overweight participants (18 females and 2 males) were included and aerobic fitness of those participants were evaluated by using 12-minute walk/ run test. Demographic variables were analyzed descriptively, using the SPSS (version 24). The mean and standard deviation for BMI is  $26.435 \pm 1.045$  and for 12-minute walk/ run test is  $1848.25 \pm 193.5$ . The mean and standard deviation for  $\text{VO}_2$  max is  $29.319 \pm 4.32$ . When the BMI increases, aerobic endurance in those individuals become also decreased accordingly.

**Table :1** Subject demographics

Variable	Mean	SD	Range
Age	20.3	1.68	18 - 22
Height	162	4.58	150 -170
Weight	69.5	4.73	58 -79
BMI	26.435	1.045	25.1 -29

BMI – Body Mass Index



Graph 1: Graphical representation of mean age

Graph 2: Graphical representation of mean height

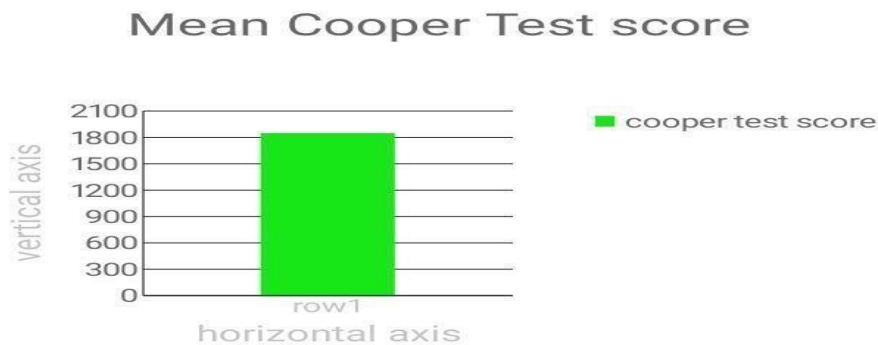


Graph 3: Graphical representation of mean weight

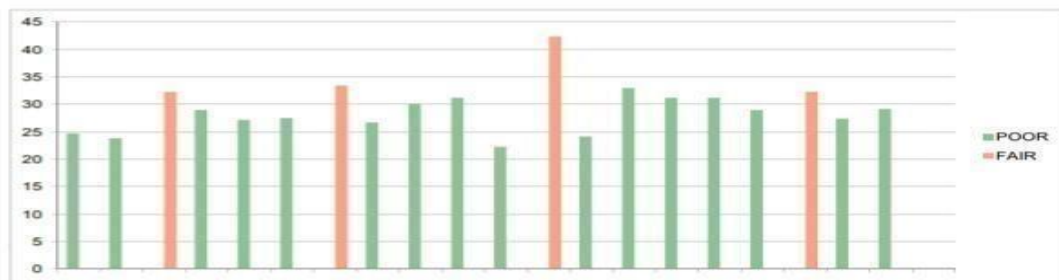
Graph 4: Graphical representation of mean BMI

**Table 2:** Results of 12-minute walk/ run test

	Mean	SD	Range
12-minute walk/run test	1848.25	193.5	1500 – 2400
VO22 max	29.319	4.32	22.23 – 42.35



**Graph 5:** Graphical representation of Mean Cooper's test score



**Graph 6:** Graphical representation of VO<sub>2</sub> max after 12-minute walk run test (Cooper's test)

## DISCUSSION

This research focused to assess the impact of a 12-minute walk/run test on an overweight healthy undergraduate population. Being an overweight individual leads to abnormal accumulation of fat in the body, creating health problems and shorten one's life expectancy. Overweight students in college may suffer a variety of negative experiences, including discrimination, bullying, and social isolation.

Epstein et al. evaluated the VO<sub>2</sub> max associated with carrying two different backpack weights while walking on a treadmill at a constant speed for an extended period of time. This research showed that carrying large loads or engaging in intensive activities that exceed 50% of one's VO<sub>2</sub> max peak can have a negative impact on one's energy efficiency and physical performance. Biomechanics of locomotion are altered. adjusted for the lower walk/run test result.<sup>[27]</sup>

On a maximal cycle ergometer test, Bart Drinkard et al, analyzed the impact between walk/run performance and cardiorespiratory fitness in overweight teenagers. There was a positive correlation with cardiorespiratory fitness measurements such as VO<sub>2</sub> peak, AT, W peak, and WAT, and a negative correlation with body adiposity measurements such as body weight, BMI, and body fat mass<sup>[12]</sup>.

The current study included 20 college students, 18 of whom were female including two were male. BMI was calculated using height and weight measurements. The aerobic fitness of the overweight students was evaluated using a 12-minute walk/run test. This study revealed that the aerobic fitness of overweight healthy college students was significantly lower than that of normal weight students. This study also stressed the importance of regular physical activity on one's well-being.

## CONCLUSION

Overweight is considered as excess accumulation of fat in the body. It causes adverse effects on health and life style. When compared to normal weight pupils, those individuals have worse aerobic fitness and capacity. A high correlation was found between the VO<sub>2</sub> max value and the 12-minute walk/run test, and its result indicates poor in those individuals. This study concluded that there will be significant effect of cooper's test on overweight healthy collegiate population.

Physical activity is the main part of management for overweight individuals as combination with diet, treatment of associated health problems and behavioral support. Aerobic exercise training can essentially help to improve the lung function as well as cardiac functions in overweight college students.

## LIMITATIONS OF THE STUDY

- Small sample size
- Male participants are comparatively less than females
- Duration of the study was short
- Obese individuals were not included

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