Body Mass Index and VO_{2max} Relationship of FKUI Fitness Challenge 2012 Participants in Gelora Bung Karno Jakarta

Introduction: In determining fatness the most common technique is measuring body mass index (BMI). Scientific evidence showed that risk of premature illness and death is greater for those who are overweight but also increased in individuals who are underweight. BMI is useful to screen general population although it fails to differentiate fat from lean body mass or determine where the most of the fat is located.
Maximum oxygen consumption determined by VO_{2max} is maximal amount of oxygen that human body can utilize per minute of physical activity. VO_{2max} shows cardiorespiratory endurance as aerobic fitness parameter. Higher oxygen consumption shows more efficient cardiorespiratory system. VO_{2max} is affected by genetics, training, gender, age, and body composition.
Fitness Challenge is a serial fitness tests held annually by Sports Medicine Program Faculty of Medicine Universitas Indonesia including BMI and cardiorespiratory endurance examination. In the year 2012 it was held in Gelora Bung Karno (GBK) Jakarta, where most Jakarta citizens spent their weekend relaxing and/or exercising. In this study we would like to describe the results of body composition examination and cardiorespiratory endurance test from that event and analyze the relationship between them.

Methods: All 59 participants of the competition were taken height, weight, and VO_{2max} measurement. Body mass index was calculated by the formula of weight in kg/(height in meter)^2. VO_{2max} was measured by field test which was Bleep test. Correlation was counted using Spearman's rho.

Results: Participants are 23 women and 36 men age 15-48 years old with mean age 32.86 ± 12.85 years old. Mean VO_{2max} is 27.94 ± 6.91 and mean BMI is 23.36 ± 3.41. There is a significant negative correlation between VO_{2max} and BMI which is -0.408 (p=0.01).

Discussion: The finding is consistent with previous study in Israel where correlation coefficients between BMI, waist circumference, and VO_{2max} were statistically significant. This study gave general description on how components of fitness interact, which are BMI as metabolic fitness parameter and VO_{2max} as aerobic fitness parameter. Higher VO_{2max} can be achieved by having lower BMI. Since this study is a cross sectional study based on field tests in a competition setting and taken in a small population of visitors in GBK Jakarta, the relationship cannot be taken as general Indonesian population. But the point that body composition is one of the factors affecting VO_{2max}, is shown. Thus people might improve their aerobic fitness by reducing their BMI to the normal value.

Ref

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