CERTIFICATE

No : 43456/UN38.9/DL.01.02/2020

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as Presenter of paper entitled

The Level of Physical Activity and Fitness Among University Student

on International Conference on Research and Academic Community Services
"**Strengthening Innovation to Enhance Revenue for the Better Future**"
hosted by Institute for Research and Community Services Universitas Negeri Surabaya

On October, 3rd - 4th 2020

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Advances in Social Science, Education and Humanities Research, volume 491
Proceedings of the International Joint Conference on Arts and Humanities (IJCAH 2020)

The Level of Physical Activity and Fitness Among University Student

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ABSTRACT
The high level of physical activity will support one's physical fitness. Physical fitness is the main indicator that can predict physical abilities and health status. The purpose of this study was to determine the level of physical activity and physical fitness of university students. This research is an analytic observational study with test and measurement methods. 490 samples with ages ranging from 18 to 23 years were recruited for data collection by fulfilling the inclusion criteria, consisting of 217 males and 273 females. The International Physical Activity Questionnaire (IPAQ) instrument to measure the level of physical activity and a series of tests to measure physical fitness that has met the validity and reliability test. The series of instruments consisted of: (1) body composition measured by body mass index; (2) cardiorespiratory fitness measured by a 1.6 km run test; (3) musculoskeletal fitness measured by a wall half squat; (4) flexibility measured by sitting and reach test. The results showed that the level of physical activity in the light category was 93 students (18.98%), the moderate category was 212 students (43.27%), and the high category was 185 students (37.75%). Physical fitness showed musculoskeletal fitness in male and cardiorespiratory fitness in female need to be improved.

Keywords: *Physical activity, Physical activity level, Physical fitness, University student*

1. INTRODUCTION

Physical activity will result in changes in the increased strength of the muscular system, cardiovascular system, and respiratory system. A good physical fitness status, a person, will not tire easily in carrying out daily activities. Better fitness status will increase work and study productivity.

According to WHO, physical activity is a body movement produced by skeletal muscles resulting in energy expenditure. Physical activity is any movement of the body produced by muscle action that increases energy expenditure. The level of physical activity has a big health impact [8]. Lack of physical activity can increase the risk of obesity and obesity. Conversely, increased physical activity reduces between 6% and 10% of NCD (non-communicable disease), especially CHD (coronary heart disease), type 2 diabetes, and breast and colon cancer, and increases life expectancy [5]. There are many advantages and relationships between physical activity and health, including 1) physical activity helps maintain energy balance and prevents obesity, 2) regular physical exercise reduces the risk of disease, 3) regular physical exercise or a high level in daily activities can prevent several types of cancer, 4) regular physical exercise can also prevent or lower blood pressure in people with hypertension [7].

Physical fitness is needed to support daily activities in order to run optimally. Physical fitness is a complex of different physical qualities ranging from speed, strength, endurance, agility, to flexibility[3]. Meanwhile, physical fitness is a person's physical ability to perform daily tasks optimally and even perform other additional physical activities without experiencing significant fatigue [14].

Factors that affect physical fitness include physical activity [1]. Sport is part of physical activity carried out in a planned and measured manner and aims to achieve fitness and achievement. Sufficient physical activity will affect individual physical fitness [9].

The American College of Sports Medicine has divided factors in body fitness that correlate with health, including cardiorespiratory endurance, body composition, muscular fitness, flexibility, and strength [10]. In this study, four tests were selected to determine

physical fitness, namely (1) body composition, (2) cardiorespiratory fitness, (3) musculoskeletal fitness, (4) flexibility.

Body composition is measured by body mass index (BMI). BMI is defined as a person's body weight in kilograms divided by the square of their height in meters (kg/m). The BMI category is obtained by measuring height and weight [6]. Musculoskeletal fitness is a component of muscle strength [2]. Cardiorespiratory fitness is the endurance of the heart and lungs [11]. Flexibility is a component of the body to be able to stretch as much as possible

Based on this background, it is necessary to measure the level of physical activity and physical fitness for students to describe the physical conditions and physical activities that need to be done in improving physical fitness in university students.

2. METHOD

This research is an analytic observational study with test and measurement methods. Where the researchers only describe the description of the physical activity and physical fitness in Universitas Negeri Surabaya students without any treatment. The population in this study were students of the State University of Surabaya aged 18 to 23 years. The selection of research subjects by random sampling, which entered the inclusion criteria and became the research subjects of 490 students consisting of 217 males and 273 females.

Physical activity was measured using the International Physical Activity Questionnaire (IPAQ). The physical activity score is obtained from the METs-minutes / week value, which is the sum of walking, moderate activity, and strenuous activity in duration (minutes) and frequency (days), multiplied by the value of each METs.

Table 1. IPAQ instrument level of physical activity categories

Category	METs Value (minutes/week)
High	> 3000
Moderate	600-3000
Low	< 600

Instruments for measuring physical fitness, namely (1) body composition measured by body mass index (BMI); (2) cardiorespiratory fitness measured by a 1.6 km run test; (3) musculoskeletal fitness measured by a wall half squat; (4) flexibility measured by sitting and reach test. The following are categories of each test instrument:

Table 2. BMI categories

Category	Male	Female
Underweight	< 18 kg/m^2	< 17 kg/m^2
Normal	18 -25 kg/m^2	17 – 23 kg/m^2
Overweight	25 – 27 kg/m^2	23 -27 kg/m^2
Obese	> 27 kg/m^2	> 27 kg/m^2

Table 3. 1.6 Run test categories

Category	Male	Female
Very Poor	< 37.1 ml/kg/min	< 30.6 ml/kg/min
Poor	37.1 – 40.9 ml/kg/min	30.6 – 33.7 ml/kg/min
Fair	41.0 – 44.1 ml/kg/min	33.8 – 36.6 ml/kg/min
Good	44.2 – 48.1ml/kg/min	36.7 – 40.9 ml/kg/min
Excellent	48.2 – 53.9 ml/kg/min	41.0 – 46.7 ml/kg/min
Superior	> 53.9 ml/kg/min	> 46.7 ml/kg/min

(https://kinesiologists.ca/wp/pt-store/free-resources/protocol-vo2-walk/)

Table 4. Wall half squat test categories

Category	Male	Female
Poor	< 30 second	< 20 second
Below Average	30 – 57 second	20 – 35 second
Average	58 – 75 second	36 – 45 second
Above Average	76 – 102 second	46 – 60 second
Excellent	> 102 second	> 60 second

(https://www.brianmac.co.uk/wallsquat.htm)

Table 5. Sit and reach test categories

Category	Male	Female
Poor	< 4 cm	< 4 cm
Below Average	4 – 6.9 cm	4 – 6.9 cm
Average	7 – 10.9 cm	7 – 11.9 cm
Above Average	11 – 14 cm	12 – 15 cm
Excellent	> 14 cm	> 15 cm

(https://www.brianmac.co.uk/sitreach.htm)

3. RESULTS AND DISCUSSION

Based on research that has been conducted on 490 subjects of Surabaya State University students, the following results were obtained:

Table 6. Characteristics of subjects

Subject	N	Age (year) Mean ± SD	Weight (kg) Mean ± SD	Height (cm) Mean ± SD
Male	217	19.20 ± 1.15	63.72 ± 13.68	168.02 ± 6.24
Female	273	18.68 ± 0.94	52.62 ± 9.15	155.93 ± 5.50

Table 7. Level of physical activity subjects

Subject	N	Mean ± SD	Min	Max
Male	217	3165.96 ± 1368.33	472.2	5336.5
Female	273	1982.65 ± 1547.60	240.0	4940.0
Total	490	2346.93 ± 1281.23	240.0	5336.5

Based on table VII. the level of physical activity in males showed the high category, while in women, it showed the moderate category. This showed the lack of daily physical activity carried out on female students.

Table 8. Percentage of physical activity level category

Level of Physical Activity	N	Percentage
High	93	18.98%
Moderate	212	43.27%
Low	185	37.75%

Based on the results of the percentage of the whole subject, it shows that students are at least in the high category (18.98%), the moderate category shows the most results (43.27%), and the low category is quite a lot (37.75%). These results show that physical activity is still low, and there are many students who do not adopt an active lifestyle. Active physical activity, according to the Basic Ministry Research (Riskesdas), is an individual who does a heavy or moderate physical activity or both, while the criterion for "less active" are individuals who do not do moderate or strenuous physical activity [3]. Based on the results of the measurement of the physical activity level of students of Surabaya State University students, it showed an average total activity of fewer than 3000 METs (moderate category).

The importance of an active lifestyle in adolescents will improve their fitness status so that in carrying out daily activities, they will not tire easily. Teens who do physical activity have better fitness than those who don't do physical activity [13]. The same thing was found by doing weekly exercise affecting VO2max, resting metabolic rate, and anaerobic threshold, all of which are indicators of physical ability and individual health. These three values increase with the difference in the frequency of exercise [4].

Table 9. Physical fitness levels of male subjects

Variables	Mean ± SD	Category
BMI	19.36 ± 8.73	Normal
Cardiorespiratory Fitness	45.38 ± 14.47	Good
Musculoskeletal Fitness	51.90 ± 36.63	Below Average
Flexibility	21.30 ± 22.56	Excellent

Based on table 9. physical fitness levels of male subjects show BMI variables in the normal category, cardiorespiratory fitness variables in the good category, musculoskeletal fitness variables in the average bellows category, variable flexibility in the excellent category.

Table 10. Physical fitness levels of female subjects

Variables	Mean ± SD	Category
BMI	18.38 ± 8.43	Normal
Cardiorespiratory Fitness	34.33 ± 7.65	Fair

Musculoskeletal Fitness	47.48 ± 25.49	Above Average
Flexibility	31.08 ± 6.58	Excellent

Based on table X. the physical fitness levels of female subjects show BMI variable in the normal category, cardiorespiratory fitness variable in fair category, musculoskeletal fitness variable in the above average category, variable flexibility in excellent category.

Teens who do physical activity have better fitness than those who don't do physical activity [13]. In this modern era, people must consider activities, activities and physical fitness as factors that affect one's health during childhood, adolescence or adulthood because physical fitness will affect the next life [12].

4. CONCLUSION

High physical activity will improve physical fitness. The results showed that the level of physical activity in the light category was 93 students (18.98%), the moderate category was 212 students (43.27%), and the high category was 185 students (37.75%). The average physical activity on all subjects showed a moderate category, this means that students still tend to lack in doing daily physical activities. Physical fitness showed musculoskeletal fitness in male and cardiorespiratory fitness in female need to be improved.

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