

# The Physical Fitness Levels Analysis of University Students

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**Abstract**—Physical fitness defined as the ability to perform daily activities without feeling fatigue. This is descriptive quantitative study using a survey method. Aiming to determine and to describe the physical fitness levels of sports science student at Universitas Negeri Semarang. Randomize sampling technique was used in this study (n = 32) both male and female. Multistage Fitness Test (MFT) was performed to test the level of physical fitness for each subject. Results showed that from female students 23.81% of subjects have low physical fitness level, 28.57% have sufficient physical fitness level, 33.33% have good physical fitness level, and 14.29% have excellent physical fitness level, while from male students 63.64% have adequate physical fitness level, 18.18% have good physical fitness level, and 18.18% have excellent physical fitness level. We concluded although there are some students in low physical fitness level, but taking the average university students are in good level. To improve this phenomenon getting better in the future, we strongly suggest to be active physically either by doing more physical activities or physical exercises.

**Keywords**—physical fitness levels, healthy lifestyle, generation Z

## I. INTRODUCTION

According to Indonesia basic health research year 2018, at national level the prevalence of degenerative diseases like diabetic mellitus, hypertension, stroke, arthritis, and kidney disease are still big issue that everyone in this country needs to contribute to suppress and make Indonesia healthier [17]. The physical inactivity has very strong relation with many kinds of degenerative disease, on the other hand being physically active are able to prevent our body against health issues impairment [10]. To obtain the best benefits from doing physical activities (combination of cardio and muscle training) it must be done at least 2,5 hours until 5 hours a week with moderate intensity or 1,25 hours to 2,5 hours with high intensity [3].

In line with physical activities, regular medical checkup is also vital thing to do for all ages in order to recall our health status or even our fitness level. Fitness assessment can be done in many different ways for five health related fitness (general health evaluation, body composition, cardiovascular endurance testing, strength and endurance testing, and

flexibility training) [6]. A study from Peter S Micalos et all in 2017 showed that first year university student revealed having health status reductions [15]. From this data point we initiated a research with aim to investigate the level of physical fitness among university student at their first year especially those who majoring in sports.

Physical fitness is a person's ability to perform daily work efficiently without incurring excessive fatigue, to be able to enjoy leisure time [4]. Regular sports activities can maintain physical fitness. Physical fitness or endurance is a physical condition to perform an exercise for long time, without experiencing excessive fatigue after completing the exercise [9]. Physical fitness is the capacity to perform physical activity and makes reference to a full range of physiological and psychological qualities. Physical activity is any body movement produced by muscle action that increases energy expenditure, whereas physical exercise refers to planned, structured, systematic and purposeful physical activity [8]. Physical fitness includes two aspects: fitness related to health, and physical fitness related to performance. Fitness related to health contains four main elements, namely: (a) muscle strength and muscular endurance, (b) aerobic resistance, (c) flexibility, (d) body composition. Physical freshness related to performance contains elements: (a) coordination, (b) agility, (c) speed of movement, (d) power, (e) balance [4]. According to Rismayanthi research showed that physical fitness gave many contributions toward student learning achievement, with an effective contribution of 28.68%. Physical fitness benefits for students is increase organs ability, social emotional, fair play and spirit of competition. Daily exercise routine and not excessive makes physical fitness level above the average [9]. A healthy human and has a good level of physical fitness will be able to excel in his work, so that the level of productivity will increase [5].

Physical fitness in children and adolescents is often forgotten. Nowadays children and adolescents tend to be less interested and less physical activity. They spend a lot of time playing with digital devices such as online games, social media and so on. Advances in science and technology make

all human activities easier. This has an impact on the reduced physical activity carried out every day. The increasing use of gadgets or smartphones is one of the impacts of technological advancements. Cell phone use can disrupt leisure time physical activity and promote sedentary behaviors among high frequency users. many high frequency users (and some low frequency users) described how the ever-present cell phone disrupted their physical activity behavior and consumed their time with cell-phone facilitated sedentary behaviors such as playing video games, surfing the internet, texting, checking social networking sites, and playing with new “applications” [2].

## II. MATERIALS AND METHODS

Thirty-two mixed male and female students were willingly participated in this study, the random sampling technique was used in this descriptive quantitative study. Research procedures of physical fitness level analysis on Sports Science Students, Faculty of Sports Science, Universitas Negeri Semarang as follow: 1) Subjects received an explanation about research background and purposes, 2) Subjects received an explanation about steps which they need to do during data collection, 3) Subjects have the right to reject and to decide not to participate in this study, to whom were agree they filled out an approval letter, 6) Multistage fitness test procedures was clearly delivered, 7) Performing the multistage fitness test, at last 9) Multistage fitness test data were converted to physical fitness levels status. Data were collected by using multistage fitness test (MFT). Descriptive quantitative data analysis was performed using the Statistics Package for Social Science (SPSS) for Windows version 21.

## III. RESULTS AND DISCUSSIONS

Physical fitness measurements result of 32 sports science as follows:

TABLE I. THE RESULT OF MULTISTAGES FITNESS TEST

Interval Class	Frequency	Cumulative Frequency
27.1-31.1	6	6
31.2-35.2	6	12
35.3-39.3	7	19
39.4-43.4	7	26
43.5-47.5	3	29
48.6-52.6	3	32

The aim of this study was to analyze the physical fitness level of university student. This study showed that the female students has adequate physical fitness level with physical fitness score of 34.05, (Table II) while the mail student has good physical fitness level with physical fitness score of 45.50, (Table IV).

TABLE II. THE AVERAGE OF FEMALE STUDENTS PHYSICAL FITNESS LEVEL

Number of Sample	Total Physical Fitness Result	Average
N=21	715	34.05

According to multistage fitness test result, known as much as 23.81% have low physical fitness level, 28.57% have sufficient physical fitness level, 33.33% have good physical fitness level, and 14.29% have excellent physical fitness level, (Table III).

TABLE III. THE CLASSIFICATION NORM OF PHYSICAL FITNESS LEVEL FOR FEMALE

Physical Fitness Level Classification Norm	Frequency
<b>Very Poor</b> (< 25)	0
<b>Poor</b> (25.0-30.9)	5
<b>Fair/Adequate</b> (31.0-34.9)	6
<b>Good</b> (35.0-38.9)	7
<b>Excellent</b> (39.0-41.9)	3
<b>Superior</b> (>41.9)	0

TABLE IV. THE AVERAGE OF MALE STUDENTS PHYSICAL FITNESS LEVEL

Number of Sample	Total Physical Fitness Result	Average
N=11	500	45.50

According to multistage fitness test result, known as much as 63.64% have adequate physical fitness level, 18.18% have good physical fitness level, and 18.18% have excellent physical fitness level, (Table V).

TABLE V. THE CLASSIFICATION NORM OF PHYSICAL FITNESS LEVEL FOR MALE

Physical Fitness Level Classification Norm	Frequency
<b>Very Poor</b> (< 35)	0
<b>Poor</b> (35.0-38.3)	0
<b>Fair/Adequate</b> (38.4-45.1)	7
<b>Good</b> (45.2-50.9)	2
<b>Excellent</b> (51.0-55.9)	2
<b>Superior</b> (>55.9)	0

Nowadays science and technology are developing very fast. Currently people entering the era of digitalization. The digital era is a term used in the emergence of digital devices and networks of computer information technology, especially

the internet. Digitalization era is the generation Z era. Generation Z is the demographic cohort after the Millennials. Demographers and researchers typically use the mid-1990s to early-2000s as starting birth years. Most of Generation Z have used the Internet since a young age and are comfortable with technology and social media. For generation Z, information and technology is something that has become part of their lives, since they were born, where access to information, especially the Internet has become a global culture, so that it affects the values, views and purpose of their lives [18]. In this age, people are spoiled by various facilities to meet their daily needs. With the existing facilities make an impact on daily activities of the community, especially children to adolescents. Children and adolescents become less active in moving, so that it affects physical health and fitness. people who have low health and fitness status, have low productivity both in carrying out daily activities, work and learning activities.

According to Rismayanthi research showed there is a positive and significant relationship between physical fitness with the learning outcomes of Wismor FIK UNY students. It shows that physical fitness provides an important contribution in learning achievement [4]. Healthy eating and physical activity patterns are important components in the lives of students and have shown to be positively correlated with academic success. For example, students engaged in healthful eating practices are less likely to be absent from school and more likely to score higher on cognitive functioning tests. Research also suggests that students who are physically active have higher brain function, higher levels of attentiveness and self-esteem, and behave more appropriately in a classroom setting. It is a priority that students of all ages adhere to their age appropriate nutrition and physical activity-based recommendations to enhance their learning potential and overall health. However, it is particularly important for college aged students to develop and sustain sound eating and exercise habits early in their college careers as lifestyle habits established during this time period are likely to carry forward into the adult years and have a critical impact on future outcomes of health and disease susceptibility [11].

Factors that affect the level of physical fitness are: (1) age, Physical fitness of children increased until reaching a maximum at the age of 25-30 years, then decline in the functional capacity of the entire body approximately 0.8-1%, but when exercising this decline can be reduced by half; (2) sex, Boys physical fitness level is usually better when compared to girls. This is because boys are more active than girls. Until puberty, usually physical fitness for boys is almost the same as girls, but after puberty boys usually have a much greater physical fitness level; (3) nutrition, A balanced nutritional intake (12% protein, 50% carbohydrate and 38% fat) can affect a person's physical fitness, because it can meet the nutritional needs of the body; (4) quality of sleep and rest, aims to recover the body condition after exercise; (5) physical activities or exercise, If physical activities are carried out according to

the principles of exercise, the correct amount of exercise and training methods will be able to produce positive results [5]. Physical fitness is part of maintaining health, people with good physical fitness level will get healthy condition.

The factors that affect the student's physical fitness level included: students lack physical activity outside school hours. Doing physical and sports activities properly, regularly and continuously is beneficial in achieving optimal physical fitness status. With regular practice, physical fitness will increase. The improvements obtained included: increased movement, not getting tired, increasing skills (skills) and so on [13]. Factors that can discourage an active lifestyle in a college environment include hectic class and work schedules, lack of discretionary time, social pressures from friends or family, crowded college gyms, and an over reliance on buses or other easily accessible motored vehicles for transportation. Various cognitive determinants such as self-efficacy, perceived enjoyment of physical activity and self-motivation are also known to influence an individual's internal desire to maintain a consistent exercise regime. Of the previous variables listed, special attention has been given to self-efficacy, as it has known to be highly correlated with participation in physical activity [8].

Physical fitness has important benefits in human life, especially in carrying out daily activities. Physical fitness also has important role to improve health and physical capability. Principally, physical fitness is a person's ability to do physical activity without experiencing significant fatigue. If someone has a poor physical fitness level, it can be ascertained that person when carrying out daily activities will get obstacles. Good physical fitness will benefit health and can reduce the risk of chronic diseases early [13]. Therefore, students who have good physical fitness can certainly do their daily activities without experiencing significant fatigue and will have greater opportunities in achieving both academic and non-academic achievements. In addition to physical fitness, student success in achieving achievement is influenced by other factors such as nutritional intake, physical activity, social and economic conditions, health conditions and psychological health. Adequate physical activity with appropriate frequency and intensity of exercise will make a positive contribution to student physical fitness. Therefore, it is important for students to do physical activity or sports activities every day.

According to the general recommendations to improve physical fitness, and to promote and maintain health, all healthy adults aged 18–65 years require moderate-intensity, endurance-based aerobic exercise for a minimum of 30 minutes, 5 days a week, for example, by walking briskly, or performing other activities that noticeably increase heart rate. It is also possible to achieve sufficient physical activity levels by performing vigorous intensity aerobic exercise for at least 20 minutes, 3 days a week, such as jogging or performing other exercises that cause rapid breathing and a substantial increase in heart rate [12]. Physical activities that improve

muscular strength, endurance, and flexibility also improve ability to perform the tasks of daily living [1]. Increases in physical activity are associated with beneficial changes in body mass, including a decrease in central adiposity, a decrease in waist circumference, and an increase in fat free mass. Therefore, it can be stated that an individual's body composition may be a strong predictor of his or her level of physical fitness [12].

Exercising to improve physical fitness can be done by paying attention to the exercise guidelines [5], including:

1. The frequency of exercise for people who are just starting training, to improve lung and heart fitness can be done with a frequency of at least 2 times a week, but it will be more optimal if done 3 times a week.
2. The intensity of the exercise, to determine the intensity of the exercise can be measured in various ways, including by measuring the heart rate. To improve cardiorespiratory fitness, exercise must reach 70% - 80% of the maximum pulse rate.
3. Exercise duration, a good duration of aerobic exercise is 20-60 minutes, carried out continuously, involving large muscles. To increase the endurance, it takes between half to one hour, whereas to burn fat it takes more than one hour.
4. Type of exercise, to improve physical fitness, the type of exercise that is suitable is aerobic exercise. In aerobic exercise, the oxygen system is the main energy source.

In addition to adequate physical activity, nutrition is also important to support student physical fitness level. The proportions of good food are: 60% carbohydrates, 25% fat, and 15% protein [7]. Nutrition has classically been perceived as a means to provide energy and building materials to the body. However, its ability to prevent and protect against diseases is starting to be recognized. Nutrition and exercise are therefore used as interventions to reverse these possible negative health effects. Recent data indicate that not only general health, but also brain functioning, is influenced through exercise and nutritional interventions [16]. Increased diet quality among these children will provide further benefit to their academic performance and, in terms of health, contribute to healthy child development, which influences health throughout the life course [14].

#### IV. CONCLUSIONS AND SUGGESTIONS

We concluded although there are some students in low physical fitness level, but taking the average university students are in good level. To improve this phenomenon getting better in the future, we strongly suggest to be active physically either by doing more physical activities or physical exercises. Good physical fitness makes students able to do all daily activities without obstacles. This is important because sports science students do sports activities every day. Good physical fitness becomes an important factor in determining

the success of study process and further achievements. Besides doing physical activity, to improve physical fitness it is recommended to do exercise. The important thing is pay attention to exercise guideline, including exercise intensity, frequency, duration of exercise, and type of training according to the needs of each individual.

#### REFERENCES

- [1] Adam Drewnowski, William J. Evans. Nutrition, physical activity, and quality of life in older adults: summary. *Journal of Gerontology*. 56A (II) 2001: 89-94.
- [2] Andrew Lepp, Jacob E. Barkley, Gabriel J. Sanders, Michael Rebold, Peter Gates. The relationship between cell phone use, physical activity and sedentary activity, and cardiorespiratory fitness in sample of U.S. College Students. *International Journal of Behavioral Nutrition and Physical Activity*. 10 (79) 2013: 1-9.
- [3] Alex M. Azar II., *Physical activity guidelines for Americans 2<sup>nd</sup> Edition., U.S. Department of Health and Human Services*. 2018: 46-65
- [4] Cerika Rismayanthi., Relationship between nutrition status and physical fitness toward students learning achievement. *Jurnal Pendidikan*. 42 (1) 2012: 29-38.
- [5] Eka Swasta Budayati. The importance of physical fitness for professional teachers. *Medikora*. V (2) 2009: 141-151.
- [6] Elizabeth Quinn. How a fitness test is performed. Accessed on Monday, 19th of August, 2019 Website: <https://www.verywellfit.com/what-a-fitness-test-can-tell-you-about-your-health-3120283>.
- [7] F. Suharjana., Heri Purwanto. Physical fitness of D II PGSD PENJAS FIK UNY students. *Jurnal Pendidikan Jasmani Indonesia*. 5 (2) 2008: 64-73.
- [8] FB Ortega., JR Ruiz., MJ Castillo., M Sjostrom., Physical fitness in childhood and adolescence: a powerful marker of health (pediatric review). 32 (2008): 1-11.
- [9] Febri Yudi Irianto., Faridha Nurhayati., Relationship between nutrition status and physical activities with physical fitness level. *Jurnal Pendidikan Olahraga dan Kesehatan*. 1 (2) 2013: 475-478.
- [10] Frank W. Booth., Christian K. Roberts., Matthew J. Laye., Lack of exercise is a major cause of chronic diseases. *Compr Physiol*. 2(2) (2012): 1143-1211. doi:10.1002/cphy.c110025.
- [11] Garrett J. Serd. Relationship between dietary intake, fitness level, and body composition in college-aged students. *Public Access Theses and Dissertations from the College of Education and Human Sciences*. 156. <http://digitalcommons.unl.edu/cehdiss/156>.
- [12] Heikiki Kyrolainen., Matti Santtila., Brandley C. Nindl., Tommi Vasankari., Physical fitness profiles of young men, Associations between physical fitness, obesity and health. *Sport Medicine*. 40 (1) 2010: 907-920.
- [13] Juhanis. Physical fitness level analysis of Sinjai Utara 2 senior high school students. *Jurnal ILARA*. 4 (1) 2013: 25-34.
- [14] Michelle D. Florence, Mark Asbridge, Paul J. Veugelers. Diet quality and academic performance. *J School Health*. 2008;78(4):209-215.
- [15] Peter S. Micalos., Alexander J. MacQuairre., Brian A. Haskins., Eileen Barry., Judith K. Anderson., Evaluation of the health and physical activity characteristics of undergraduate paramedic and nursing students. *Australian Journal of Paramedicine*. 14(2) 2017: 01-07.
- [16] Romain Meeusen. Exercise, Nutrition and the Brain. *Sports Medicine*. 44 (1) 2014: S47-S56.
- [17] The Ministry of Health of the Republic of Indonesia., The primary results of Indonesia basic health research: 2018. Transl. Kementerian Kesehatan Republik Indonesia., Hasil utama RISKESDAS. RISKESDAS: 2018.
- [18] Yanuar Surya Putra. Theoretical Review: Generation Difference Theory. *Among Makarti*. 9 (18) 2016: 123-134.