ORIGINAL ARTICLE

The Association Between the Physical Fitness Index and the Grade Point Average in Faculty of Medicine UMSU Students

Debby Mirani Lubis, Robitah Asfur

Department of Physiology, Faculty of Medicine, Universitas of Muhammadiyah Sumatera Utara, Medan, Indonesia

Correspondence email: debbymirani@umsu.ac.id

Abstract: The GPA (Grade Point Average) is the passing score for each course a student gets every semester which is currently often used as a requirement for further study students (Masters or Specialists) or applying for jobs so that the GPA is considered important to describe student intelligence during taking the educational process. Many things affect student intelligence, one of which will be discussed and proven in this study is the value of the Physical Fitness Index. This study aims to determine the relationship between the Physical Fitness Index and the GPA score of FK UMSU students. This research is an analytical study using a cross-sectional approach. The research site was conducted at the Faculty of Medicine UMSU from April to June 2020. A total of 94 subjects with male gender totaled 25 people (26.6%), women totaled 69 people (73.4%). Based on the measurement of the Physical Fitness Index which was carried out using the Harvard Step Test method, the mean value of all 2018 students was 49.57. The average GPA of all 2018 students was 3.00. Based on the results of the statistical test, the relationship between the Faculty of Medicine UMSU student body fitness index and the cumulative grade point average is $p = 0.87$. Therefore, it can be concluded that there is no significant association between the Faculty of Medicine UMSU student body fitness index and the grade point average.

Keywords: GPA, Physical Fitness Index, Harvard Step Test

INTRODUCTION

The Grade Point Average (GPA) is the result of the assessment of the learning achievement of graduates at the end of the Study Program which is stated in a quantity calculated by adding the multiplication between the letter value of each course taken and the Semester Credit Unit of the subject divided by the number of Semester Credit Units for the course taken that has been taken. Assessment reports are in the form of student success qualifications in taking a course that is stated in the range of letters A-E. Colleges may use intermediate letters and intermediate numbers for values in the range 0 (zero) to 4 (four).[1]

The GPA value can describe the intelligence and success of students in the learning process so that this value is widely used as a condition for applying for jobs and further study. There are many postgraduate and specialist study programs that make a minimum GPA requirement for admission of new students as well as the registration requirements for CPNS selection and private institutions. The GPA score is also used to assess the accreditation of a study program.

Many factors affect student intelligence, both internal and external factors. Internal factors are factors that come from physical (health and fitness), psychological (intellectual, emotional, motivational), and social (ability to socialize with the environment). External factors are the degree of difficulty of the material being studied, the place of study, the climate, the environment, the learning culture of the community and so on.[2]

Regular exercise is a way to improve physical fitness. There have been many studies that prove the effectiveness of exercise on brain intelligence. Regular exercise can be beneficial for neuroplasticity and cognitive function by increasing the expression of Brain-Derived Neurotrophine Factor (BDNF) mRNA, a neurotrophin that is widely found in the hippocampus area.[3] Exercise can trigger synaptic plasticity and improve memory by changing the balance of enzyme activity.[4]

The Physical Fitness Index is a fitness score commonly assessed using the Harvard Step Test, a cardiac stress test and fitness test that is widely used around the world. In this test, a person is assessed for their heart fitness level (ability index) by examining the heart's recovery ability level after being given intervention in the form of strenuous exercise. The heavy exercise will be done in the form of going up and down the bench. The sooner the heart rate returns to normal, the better the fitness level.[2,3]

The purpose of this study was to determine the significance of the relationship between the Physical Fitness Index and the student's GPA so that if a significant relationship is obtained, further counseling can be planned to improve students' physical fitness.

METHODS

This research is an analytical study using a cross-sectional approach, which is to find the relationship between the Physical Fitness Index and the GPA score of the Faculty of Medicine UMSU students. The place of research was carried out in the Physiology Laboratory of the Faculty of Medicine UMSU which was equipped with the tools and materials needed for research.

The population in this study was the Faculty of Medicine UMSU students. The research sample was students of the Faculty of Medicine UMSU class 2018. The

research inclusion criteria were students of the Faculty of Medicine UMSU class of 2018 who had participated in the Cardiology block physiology lab. Meanwhile, the exclusion criteria were students whose BMI was obese.

The work procedure begins with collecting data from the results of the practicum report on the physical fitness index using the Harvard Step Test method. GPA data is taken from data stored in the Faculty of Medicine UMSU Medical Education Study Program.

The data that has been collected will be checked for data completeness, then coding, tabulating data, and data entry into the computer will be carried out. Then the data is processed using SPSS (Statistical Package for The Social Science), then analyzed descriptively using frequency distribution tables the data is processed by statistical tests.

RESULTS

The number of subjects is 94 people. There were 25 men (26.6%), 69 women (73.4%). The mean value of body weight is 57.6 kg. The Mean Height is 158 cm. The mean BMI value was 22.8 kg/m^2.

Based on the measurement of the Physical Fitness Index which was carried out using the Harvard Step Test method, the mean value of all 2018 students was 49.57. The minimum value is 20 and the maximum is 115.

Based on the GPA value data obtained from the FK UMSU Assessment division, the average GPA of all 2018 students was 3.00 with a standard deviation of 0.39.

The lowest GPA score was 1.61 and the highest score was 3.69.

Table 1. Characteristics of Research Subjects

Variable	n (person)	Percentages (%)
Gender:		
Male:	25	26,6
Female:	69	73,4
Average weight (kg):	94	57,6
Average height (cm)	94	158
IMT mean	94	22,8

Table 2. Mean of *Physical Fitness Index*

Variable	n (person)	Percentages (%)	Mean	sd
Physical Fitness Index	94	100	49,58	25,8

Table 3. Mean of Grade Point Average

Variable	n (person)	Percentages (%)	Mean	sd
Grade Point Average	102	100	3,00	0,39

Based on the normality test, the data were normally distributed, so that to assess the relationship between variables, the Pearson statistical test was used.

Based on the results of this study, it was found that the FK UMSU student body fitness index was not related to the grade point average with p = 0.87.

Table 4. Association between Physical Fitness Index and Grade Point Average

Variable	n (person)	Mean	sd	p
Physical Fitness Index	94	49,58	25,8	0,87
Grade Point Average	94	3,00	0,39	

DISCUSSION

In this study, more subjects were female than male. The ages of the subjects were considered equal. The mean of BMI value of the subjects is in normal range because obesity student was excluded of this research.

Based on the GPA value (with 4,0 scale), the average GPA of all students was good (3,00 ± 0,39).

The result of Physical Fitness Index of this study determined that the students have low physical fitness index (49,57). The low fitness of students can be caused by many factors. One main factor that made low fitness index is the sedentary life style of most students with no physical activity.[5,6]

Based on this study, there is no relationship between the Physical Fitness Index and the Grade Point Average. This result was similar with study of Puji Astuti and Siti Fathonah in 2019 on 97 students of the Faculty of Engineering, Universitas Negeri Semarang.[7] This is not in line with that research conducted in Universitas Malahayati Bandar Lampung that found there was a significant effect between physical activity against the GPA.[8]

CONCLUSION

Based on the research results, it was found that as many as 94 subjects with male gender were 25 people (26.6%), women were 69 people (73.4%). Based on the measurement of the Physical Fitness Index which was carried out using the Harvard Step Test method, the mean value of all 2018 students was 49.57. The average GPA of all 2018 students was 3.00. Based on the results of the statistical test, the relationship between the Faculty of Medicine UMSU student body fitness index and the cumulative grade point average is p = 0.87. Therefore, it can be concluded that there is no significant relationship between the Faculty of Medicine UMSU students' physical fitness index and the grade point average. It is necessary to conduct further research with a larger sample.

REFERENCES

1. Permendikbud Nomor 3 Tahun 2020
2. Purwanto, Ngalim. 2004. Psikologi Pendidikan. Jakarta. PT. Remaja Rosdakarya
3. Stathopoulos, J.N., Tzanninis, J-G., Philippou, A., Koutsilieris, M. 2013. Epigenetic regulation on gene expression induced by physical exercise. J Musculoskelet Neuronal Interact; 13(2):133-146.
4. Fernandes, J., Arida, R.M., Gomez-Pinilla, F. 2017. Physical exercise as an epigenetic modulator of brain plasticity and cognition. Elsevier: Neuroscience and Biobehavioral Review 80. pp 443-456
5. Sunadi D, Soemardji AA, Apriantono T, Wirasutisna KR. Tingkat kebugaran jasmani dan prestasi belajar. J Sosioteknologi. 2018;17(2):326-336.
6. Setiawan, H., Aksan, H., Fajar, D.A. 2007. Pendidikan olahraga, pengalaman 17 tahun dalam pelembagaan dan penyelenggaraan mkor di ITB. Kelompok Keilmuan

Ilmu Keolahragaan, Sekolah Farmasi: ITB.

7. Astuti P. Pengaruh Aktivitas Fisik dan Status Gizi terhadap Prestasi Akademik Mahasiswa Fakultas Teknik Unnes Tahun 2019.2019 Tekhnobuga;7(2):92-101.

8. Alfarisi R. Pengaruh Kebugaran Jasmani, Aktifitas Fisik, dan Indeks Massa Tubuh Terhadap Indeks Prestasi Kumulatif (IPK) Mahasiswa Kedokteran Universitas Malahayati Bandar Lampung. J Kedokt dan Kesehat. 2014;1(1):54-62.