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HEALTH-BASED PHYSICAL FITNESS LEVEL BY GENDER AMONG FORM SIX SPORTS SCIENCE STUDENTS IN THE STATE OF KEDAH

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ABSTRACT

Background: Physical fitness has a strong relationship with health and academic achievement. This study aims to identify the health-related physical fitness level among Form Six Sports Science students in the State of Kedah by gender.

Methods: 225 students (107 male and 118 female) were purposively selected to participate in this descriptive study. This study was conducted using the Prudential FITNESSGRAM® test battery instrument, which introduced by Cooper Institute for Aerobics Research, (1992). Researchers determine the physical fitness level of the subjects using five test items: cardiovascular endurance, muscle endurance, muscle strength, flexibility, and body mass index (BMI).

Results: The findings use descriptive statistical analysis to identify the physical fitness level based on health components using the norms developed by Elumalai et al. (2019). The overall fitness analysis showed that almost 50% of boys and girls were in the range of a good level. Around 20% were in the range of moderate and very good respectively. Meanwhile, less than 5% were excellent in both genders. Analysis based on separate components showed most of the subjects, around 80% were in the range of moderate to very good.

Conclusion: This study indicates that Form Six Sports Science student's physical fitness should be tested and evaluated before enrolling in Form Six sports Science program. This will ensure that they are healthy and have the quality as expected for future sports personals towards the development of the Malaysian sports industry.

Keyword: Sports Science Student, Physical Fitness, Form Six, Prudential FITNESSGRAM®, Healthy, Academic achievement.

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INTRODUCTION

Physical fitness is a dynamic development that is constantly evolving and essential in health and daily life, as well as demonstrating the ability of an efficiently functioning body of an individual [1]. Total fitness can be defined by how well the body performs in each one of the components of physical fitness as a whole. Physical fitness based on health is cardiovascular endurance, muscle endurance, muscle strength, flexibility, and body composition. [1, 2, 3]. Health-related physical fitness is very important in our life to prevent non-communicable diseases. The physical fitness level influence by gender among all age groups of people. Most of the research indicated that gender plays a major role in the physical fitness level globally [4].

The Malaysian Education Ministry introduced the National Physical Fitness Standard (SEGAK) evaluation since 2018 for students from year four to form five twice a year, in March and August. This physical fitness test compulsory for all the students unless they have any critical illness [5]. Implementation of the SEGAK test is based on the government's concern through the Ministry of Health Malaysia (MOH), due to the increase of percentage in non-communicable diseases and obesity. The ultimate goal of SEGAK's implementation is to create awareness and develop self- participation in physical activities or fitness activities to maintain life-long physical fitness. This will motivate students to practice a healthy lifestyle in line with the National Education Philosophy [6].

Physical fitness test explicitly conducted for children and adolescents will be an accurate indicator of their fitness status at schools [7, 8, 9]. According to the National Health Morbidity Survey (NHNM) report released by the Ministry of Health Malaysia (2018), 55% of secondary school students are overweight and 14% obese. Furthermore, the findings from NHNM, 2015 showed that 36.9% of the population aged 18 to 59 years old do not practice or perform any form of physical activity. This indicates that a total of 4 out of 10 people do not perform any physical activity in the country. The latest survey in 2017 also showed the number of inactive Malaysian population increase day by day towards an unhealthy lifestyle [4].

Most of the descriptive epidemiological studies of youth physical activity have consistently reported that male subjects are more active than female subjects, and the involvement in physical activity declines with age [10]. Boys' are more active than girls during adolescence may purely be an artifact of boys maturing later than girls and, as a result, altering their physical activity behavior later. Gender differences in physical activity disappear when aligned on maturational age, suggesting that physical maturity may be intricately involved in the adolescent decline in physical activity [11]. Hale, (2014), confirms that male students demonstrated higher levels of physical fitness, greater self-efficacy in overcoming barriers to physical activity and higher levels of participation in community sports and physical activity organizations compare to girls due to cultural and environmental factors. There are studies showed students participating in fitness activities and sports activities would be able to reduce the percentage of fat and increase muscle strength [12, 13].

Previous studies showed a relationship between physical activities and the degree of an individual's function [14]. Ruiz, Castro-Pinero, Artego, Ortega, Sjostrom, Suni, and Castillo (2009), conclude that there is a relationship between fitness and health through predictions made in children and adolescents. The level of fitness at a young age, and adolescents enable us to predict their future health [15]. Physical fitness measurements and assessments need to be done as a priority for public health and are the best indicator of the younger generation's health status [16].

Based on the current situation and life's trend, the researchers interested in evaluating form six sport science students' health-related physical fitness after their secondary education. The SEGAK's test is compulsory until form five in a secondary school; after that, it's up to the individuals to continuously evaluate themselves or not. This study aims to identify the student's fitness level by gender after leaving their secondary education. The study also will show the level of awareness towards active living and healthy lifestyle among the students who are selected to study Sports Science course as a major subject after leaving secondary school education.

METHODOLOGY

The study was conducted to identify the health-related physical fitness level based on gender among form six Sports Science students in Kedah. The study was conducted in the form of "ex-post-facto" research, which is simple but has high internal validity [17]. The sample consists of 225 form six students (107 male & 118 female). Samples were selected using a purposive sampling method aimed at all students of Sports Science stream in the state except students with permanent health problems. The data were collected from the subjects as they are, without any training, intervention or treatment provided. For physical fitness level tests, researchers use Prudential FITNESSGRAM® testing battery, which includes the PACER test, curl-up test, pushups 90^0 test, trunk lift test, and BMI test. The research using the "ex-post-facto" design widely used by researchers in producing norms for physical fitness tests [18].

Researchers use the norms developed by Elumalai et al. (2019), as a guide to identifying physical fitness level based on health components among Form Six male and female sports science students. Table 1, shows the overall physical fitness level, which referred by researchers. The body composition was measured with BMI test using norms set by the WHO [19].

Table 1: Level of overall Physical Fitness for Male and Female Sports Science Students, Elumalai et al. (2019)

Level	weak		moderate		good		very good		excellent		
Male	**184.22 And below**		**184.23 -207.83**		**207.84 -232.86**		**232.87 -257.17**		**257.18 and above**		
	n	**%**	**n**	**%**	**n**	**%**	**n**	**%**	**n**	**%**	Σn
	6	5.6	24	22.4	50	46.7	24	22.4	3	2.8	107
Level	**weak**		**moderate**		**good**		**very good**		**excellent**		
Female	**154.69 And below**		**154.70 -172.36**		**172.37 - 190.05**		**190.06 -207.72**		**207.73 and above**		
	n	**%**	**n**	**%**	**n**	**%**	**n**	**%**	**n**	**%**	Σn
	3	2.5	28	23.7	58	49.2	24	20.3	5	4.2	118

RESULTS

Table 2 shows the overall physical fitness level as a whole for Form Six Sports Science students. As many as 2.8% or 3 Form Six sports science male students are at an excellent level, 24 are a very good level or 22.4%. 50 male students were in good level at 46.7% of the total sample. 6 students or 5.6% are at weak and 24 students at moderate level or 22.4%. For girls, a total of 58 students achieved good level at 49.2%. 24 students were very good, and 5 were excellent at 4.2%. 28 students of sports science or 23.7% are at moderate level and 3 or 2.5% are at weak level.

Table 2: Level of overall Physical Fitness for Male and Female Sports Science Students by gender

Level	weak		moderate		good		very good		excellent		
Male	**184.22 And below**		**184.23 -207.83**		**207.84 -232.86**		**232.87 -257.17**		**257.18 and above**		
	n	**%**	**n**	**%**	**n**	**%**	**n**	**%**	**n**	**%**	Σn
	6	5.6	24	22.4	50	46.7	24	22.4	3	2.8	107
Level	**weak**		**moderate**		**good**		**very good**		**excellent**		
Female	**154.69 And below**		**154.70 -172.36**		**172.37 - 190.05**		**190.06 -207.72**		**207.73 and above**		
	n	**%**	**n**	**%**	**n**	**%**	**n**	**%**	**n**	**%**	Σn
	3	2.5	28	23.7	58	49.2	24	20.3	5	4.2	118

Based on Table 3 below, cardiovascular endurance showed 57 (53.3%) male students are at good level 26(24.3%) people were very good, and 2 (1.9%) were excellent. At a moderate level are 16 (15.0%) students and at weak level are 6 (5.6%). The analysis of female students showed 54 (45.8%) are at good level. 24 (20.3%) people are very good, and 9 (7.6%) people are excellent. At the moderate level it is 30 (25.4%) and at weak level is 1 (0.8%) person only.

Curl-up test used to test muscle endurance. A total of 3 (2.8%) male students were at an excellent level. 31 (29.0%) students at very good level and 32 (29.9%) people at good level. While at moderate level were 38 (35.5%) people and 3 were weak. The number of female students who achieved good level was 46 or 39.0%. 35 people at very good level or 29.7% and 3 people were excellent or 2.5%. At the moderate level there were 31 sports science students or 26.3%, and at weak levels were 3 (2.5%).

The level of muscle strength measured using the Push up 90° test. For male students, a total of 42 (39.3%) people at a good level followed by 19 (17.8%) people at a very good level. At the level of excellent was 9 (8.4%). 36 (33.6%) people were at a moderate level and 1(0.9%) at weak level. The female students who were at an excellent level are 9 (4.2%), followed by 30 (25.4%) people at a very good level. 46 (39%) students got good level. 35 (29.7%) students were at moderate level, and the weak level was 2 (1.7%) persons.

The flexibility component was tested using a trunk lift test on male and female students. 53 (49.5%) male students were at a good level. At very good level was 25 (23.4%). The excellent level was 1 (0.9%) person. A weak level was 4 (3.7%) and followed by 24 (22.4%) people at moderate level. Based on Table 2 below, 55 (46.6%) female students were at good level. 22 (18.6%) people were at very good level, and 6 (5.1%) were excellent. At the moderate level were 34 (28.8%) students, and 1 (0.8%) was weak.

Table 3: Level of physical fitness by component

					LEVEL						
PACER	**weak**		**moderate**		**good**		**very good**		**excellent**		Σn
	25.29 And below		**25.30 – 31.76**		**31.77 – 38.21**		38.22 – 44.66		**44.67 and above**		
	n	**%**	**n**	**%**	**n**	**%**	**n**	**%**	**n**	**%**	
M	6	5.6	16	15.0	57	53.3	26	24.3	2	1.9	107
	20.53 And below		**20.54 – 23.38**		**23.39 – 26.25**		**26.26 – 29.10**		**29.11 and above**		
	n	**%**	**n**	**%**	**n**	**%**	**n**	**%**	**n**	**%**	
F	1	0.8	30	25.4	54	45.8	24	20.3	9	7.6	118

Curl-up	**20.61 And below**		**20.62 – 28.82**		**28.83 – 37.03**		**37.04 – 45.24**		**45.25 and above**		
	n	**%**	**n**	**%**	**n**	**%**	**n**	**%**	**n**	**%**	
M	3	2.8	38	35.5	32	29.9	31	29.0	3	2.8	107
	11.61 And below		**11.62 – 20.64**		**20.64 – 29.69**		**29.69 – 38.72**		**38.73 and above**		
	n	**%**	**n**	**%**	**n**	**%**	**n**	**%**	**n**	**%**	
F	3	2.5	31	26.3	46	39.0	35	29.7	3	20.5	118
Push up	**5.53 And below**		**5.54 – 16.93**		**16.94 – 28.35**		**28.36 – 39.74**		**39.75 and above**		
	n	**%**	**n**	**%**	**n**	**%**	**n**	**%**	**n**	**%**	
M	1	0.9	36	33.6	42	39.3	19	17.8	9	8.4	107
	0.99 And below		**1.00 – 4.55**		**4.56 – 9.22**		**9.23 – 13.87**		**13.88 and above**		
	n	**%**	**n**	**%**	**n**	**%**	**n**	**%**	**n**	**%**	
F	2	1.7	35	29.7	46	39.0	30	25.4	5	4.2	118
Trunk Lift	**15.02 And below**		**15.03 – 21.98**		**21.99 – 28.95**		**28.96 – 35.91**		**35.92 and above**		
	n	**%**	**n**	**%**	**n**	**%**	**n**	**%**	**n**	**%**	
M	4	3.7	24	22.4	53	49.5	25	23.4	1	0.9	107
	15.40 And below		**15.41 – 22.27**		**22.28 – 29.14**		**29.15 – 36.01**		**36.02 and above**		
	n	**%**	**n**	**%**	**n**	**%**	**n**	**%**	**n**	**%**	
F	1	0.8	34	28.8	55	46.6	22	18.6	6	5.1	118

M = Male F = Female

The body composition was measured with BMI test using norms set by WHO [19]. A total of 18 (16.8%) males were underweight and followed by normal level 58 (54.2%). 20 (18.7%) people were overweight, 10 (9.3%) students were in class 1 obesity and 1 (0.9%) in obesity class 2. The female students were 23 (19.5%) underweight, 70 (59.3%) people were at a normal level followed by 25 (21.2%) people were overweight, While no female students were in obesity class I, class 2 or class iii. Refer to Table 4 below.

Table 4: BMI levels of form six students

	LEVEL												
PACER	**Under Weight**		**Normal**		**Over Weight**		**Obese Class i**		**Obese Class ii**		**Obese Class iii**		Σn
	18.5 And below		**18.5 – 24.9**		**25.0 – 29.9**		**30.0 – 34.9**		35.0 – 39.9		**40.0 and above**		
	n	**%**	**n**	**%**	**n**	%	%	%	**n**	**%**	**n**	**%**	
Male	18	16.8	58	54.2	20	18.7	10	9.3	1	0.9	0	0.0	107
Female	23	1.5	70	59.3	25	21.2	0	0.0	0	0.0	0	0.0ss	118

DISCUSSION

The main purpose of this study is to look at the health-based physical fitness level of Form Six sports science students in Kedah based on gender. Researchers conducted data collection at all Form Six schools offering sports science in Kedah. The analysis uses min and standard deviations and norms that have been developed to identify physical fitness levels based on fitness components between genders. Overall, many male and female students are in good level zone in health-based physical fitness. As many as 46.7% of the boys are at good levels, followed by 22.4% at very good levels and 2.8% at excellent levels.

Meanwhile, for girls, 49.2% were good, 20.3% were very good, and 4.2% were excellent. Physical fitness retention and the implementation of good physical activity should not only focus on sportsmen or adults but need to be emphasized to every individual especially to students who are becoming adults. All individuals require physical fitness and not only individuals who are involved in sports because one's health is not assessed in terms of an absence of illness but also determined by the individual's physical fitness level [20].

Based on the Multilateral training as recommended by Bompa, individuals' development based on the freedom of movement in children as a broad base effort on future physical fitness. The importance of multilateral training has been recognized by sports scientists who are characterized by the inclusion of this multilateral training in fitness as a life- long process [21]. The findings of this study indicate that the academicians in Malaysia, especially at the school level, should take proper action to make the basic fitness level achieved from schools and practiced by students throughout their life.

Measurement of physical fitness levels of students, especially the Sixth Form Sports Science students, is an important addition to new knowledge in the field of measurement as there has been no such study conducted on Form Six students. Additionally, through this study, the level of fitness of students can be evaluated to help them in adopting a healthy lifestyle. This statement emphasizes that

students involved in fitness and sports activities will gain a good impact on their bodies and studies as recommended by other researchers [22, 12]. Participating in physical activities since childhood will help teenagers to protect their health in the future. This study also indicates that physical fitness assessments should be implemented as guidance or indicators of adolescent health as suggested by most of the wellness trainers [23, 24]. Emphasis on physical fitness measurements on Form Six sports science students should be compulsory, especially in Kedah, so that they will always be in a healthy and vibrant zone and ensure all sports science students have the expected quality.

CONCLUSION

Further studies have to be done to produce a standard norm at the national level so that Form Six students in all states can perform this testing and evaluation. The implementation and use of this test battery should be extended to other states to establish a consistent and standard national norm. Overall, researchers have concluded that such studies, can help students to identify their physical fitness levels through fitness components such as cardiovascular endurance, muscle endurance, muscle strength, flexibility, and body composition. Also, through this evaluation, sports personals especially sport science teachers, will find it easy to plan for appropriate activities by considering the gender differences to enable students to involve and maintain an optimum level of physical fitness. This field of testing, measurement, and evaluation is not only important in the sports world, but it is also very important in daily life. School students especially Form Six students who are learning sports education as a carrier path should be in good health and knowledgeable in this field to become the change agent for the nation.

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