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Article

Level of physical fitness of member of Indonesian Medical Association in Bantul, Yogyakarta

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ABSTRACT

Physical inactivity contributed to 7.2% of all-cause mortality. Many research demonstrates that the integration of physical activity and exercise into daily routine prevents chronic disease and lowers mortality. This study aims to assess the physical fitness of members of the Indonesian Medical Association in the Bantul region using a descriptive from secondary data. The subjects were 38 members of the Indonesian Medical Association. Physical fitness data was obtained using the Rockport One Mile Walking Test. Body Mass Index (BMI) is also calculated to describe excessive body fat. The majority of participants are female (52.63%) and participants dominant age ranged between 19 and 44 years old (50%). The participants aged 18 years old showed good physical fitness. The results in participants aged 19 to 44 years were more varied, there were 8 participants, 7 participants, 3 participants 1 participant had fair, good, poor, and very poor physical fitness, respectively. Physical fitness in participants aged 45 to 59 years were 9 and 5 participants showed good and fair physical fitness, respectively. The subjects aged >59 years old have 2 people with good physical fitness and 1 person with fair physical fitness. None of the participants with BMI status underweight, normal weight, or overweight showed poor physical fitness, while participants with obesity had poor and very poor physical fitness. Physical fitness is a multidimensional concept and is related to regular activity.

INTRODUCTION

The latest worldwide figures indicate that 27.5% of adults and a staggering 81% of adolescents fall short of meeting the recommended levels of aerobic exercise, as outlined in the 2010 Global Recommendations on Physical Activity for Health. In 2016, the global age-standardized prevalence of insufficient physical activity was 27.5%. In the latest research, physical inactivity contributed to 7.2% of all-cause mortality, particularly in middle-income countries, in which 69% of total deaths were associated with physical inactivity. This highlights a pressing necessity to elevate the importance of and allocate resources towards initiatives aimed at promoting physical activity, not only within the healthcare sector but also across other pivotal domains[1,2]. Research consistently demonstrates that integrating daily physical activity (PA) and exercise into one's routine significantly lowers the risk of chronic diseases and mortality. Moreover, it serves as a powerful tool for primary disease prevention[3].

The function of physical activity in preventing a wide range of chronic illnesses and premature mortality has been extensively examined and studied. Adequate evidence links medical conditions such as cardiovascular disease and individual lifestyle behaviors, particularly exercise. Exercise is shown to keep other physical functions (respiratory, circulatory, muscular, nervous, and skeletal systems) intact and supports other systems (endocrine, digestive, immune, or renal systems) that are important in fighting any known or unknown threat to our body. The evidence about the health benefits of regular physical activity is well established and so are the risks of sedentary behavior[4–6]. This study aims to assess the physical fitness of members of the Indonesian Medical Association in the Bantul region.

METHODS

This study used a descriptive method. The data were obtained from data records from the Indonesian Medical Association in the Bantul region. The subjects of this study were 38 people as members of the Indonesian Medical Association in the Bantul region.

Table 1. Classification of BMI

Classification	***BMI (Kg/m²)***
Underweight	< 18.5
Normal	18.5 - 22.9
Overweight	23 - 24.9
Obesity I	25 - 29.9
Obesity II	> 30

Table 2. Relationship of Travel time-VO2max

Number	Traveling Time (minutes, seconds)	VO2Max ml/kg / minute
1	5'18" – 5'23"	62
2	5'24" – 5'29"	61
3	5'30" – 5'35"	60
4	5'36" – 5'42"	59
5	5'43" – 5'49"	58
6	5'50" – 5'56"	57
7	5'57" – 6'04"	56
8	6'05" – 6'12"	55
9	6'13" – 6'20"	54
10	6'21" – 6'29"	53
11	6'30" – 6'38"	52
12	6'39" – 6'48"	51
13	6'49" – 6'57"	50
14	6'58" – 7'08"	49
15	7'09" – 7'19"	48
16	7'20" – 7'31"	47
17	7'32" – 7'43"	46
18	7'44" – 7'56"	45
19	7'57" – 8'10"	44
20	8'11" – 8'24"	43
21	8'25" – 8'40"	42
22	8'41" – 8'56"	41
23	8'57" – 9'14"	40
24	9'15" – 9'32"	39
25	9'33" – 9'52"	38
26	9'53" – 10'14"	37
27	10'15" – 10'36"	36
28	10'37" – 11'01"	35
29	11'02" – 11'28"	34
30	11'29" – 11'57"	33
31	11'58" – 12'29"	32
32	12'30" – 13'03"	31
33	13'04" – 13'41"	30
34	13'42" – 14'23"	29
35	14'24" – 15'08"	28
36	15'09" – 16'00"	27
37	16'01" – 16'57"	26
38	16'58" – 18'02"	25
39	18'03" – 19'15"	24
40	19'16" – 20'39"	23
41	20'40" – 22'17"	22
42	22'18" – 24'11"	21

Physical fitness data collection using the Rockport test as far as 1600 m, check pulse before and after doing the test, measurement of height and weight. Rockport One Mile Walking Test (Rockport Shoes Walking Institute, 1986) is a sub-maximal field test to estimate VO2 max in males and females ages 20 to 69 years. The participant is required to walk one mile (1.6 kilometers) as

quickly as possible. Participants should wear appropriate clothing plus shoes and perform 5-10 min of light stretching before commencing the walk. Instruct the participant to walk the one mile as quickly as possible (but not speed walking) or run as constantly.

Record the participant's heart rate (HR) immediately upon the completion of the mile. It is preferable to have the participant wear a heart rate monitor for this measurement but the assessment of HR via palpation (using a 15-second count from the carotid or radial artery). Record the time of the test completion (minutes and seconds). Estimate the participant's VO2max using the following formula: VO2max = 132.853 (0.0769 × body weight in pounds) 0.3877 × age in years+(6.315 × sex score) (3.2649 × time in minutes to walk 1 mile) (0.1565 × heart rate at the end of the walk), which integrates his/her body weight (lb), age (yr.), gender (males = 1, females = 0), time to complete one mile (min), and post-exercise heart rate (bpm)[7]. The data of traveling time was calculated and entered in Table 2. And the criteria of physical fitness in Table 3. Furthermore, the data will be classified as physical fitness in women and men in Table 3. We also calculated Body Mass Index (BMI) to describe excessive body fat. We state the classification of BMI in Table 1.

Table 3. Criteria of physical fitness according to AHA-1972

Gender	*Age (years)*	*Very Less*	*Less*	*Enough*	*Good*	*Very well*
Woman	20 – 29	< 24	24 – 30	31 – 37	38 – 48	49+
	30 – 39	< 20	20 – 27	28 – 33	34 – 44	45+
	40 – 49	< 17	17 – 23	24 – 30	31 – 41	42+
	50 – 59	< 15	15 – 20	21 – 27	28 – 37	38+
	60 – 69	< 13	13 – 17	18 – 23	24 – 34	35+
Men	20 – 29	< 25	25 – 33	34 – 42	43 – 52	53+
	30 – 39	< 23	23 – 30	31 – 38	39 – 48	49+
	40 – 49	< 20	20 – 26	27 – 35	36 – 44	45+
	50 – 59	< 18	18 – 24	25 – 33	34 – 42	43+
	60 – 69	< 16	16 – 22	23 – 30	31 – 40	41+

RESULTS

The participants of The Rockport One Mile Walking Test are 38 persons of various ages. The characteristics of the study are provided in Table 4. The participants aged 18 years old have good physical fitness. The participants aged 19 to 44 years old were 8 participants with fair physical fitness, 7 participants with good physical fitness, 3 participants with poor physical fitness, and 1 participant with very poor physical fitness. Participants aged 45 to 59 years old were 9 participants with good physical fitness and 5 participants with fair physical fitness. The subjects aged >59 years old have 2 people with good physical fitness and 1 person with fair physical fitness

Table 4. Characteristic of study

	n	*%*
Gender		
Female	20	52.63
Male	18	47.37
Age		
<18	2	5.3
19-44	19	50
45-59	14	36.8
>59	3	7.9

From the table, the majority of participants are female. The dominant age of participants ranged between 19 and 44 years old (50%).

Table 5. Age-related to physical fitness

		Rockport Classification				
		very poor	***poor***	***fair***	***good***	***excellent***
Age (years)	18	0	0	0	2	0
	19 - 44	1	3	8	7	0
	45 - 59	0	0	5	9	0
	>59	0	0	1	2	0

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Table 3. IMT related to physical fitness

		Rockport Classification				
		very poor	***poor***	***fair***	***good***	***excellent***
BMI	Underweight	0	0	1	1	0
	Normal	0	0	1	7	0
	Overweight	0	0	4	9	0
	Obesity I	0	2	5	3	0
	Obesity II	1	1	3	0	0

The participants with BMI status underweight have 1 fair physical fitness and 1 good physical fitness. Normal weight participants have 7 with good physical fitness and 1 with fair physical fitness. Overweight participants have 9 with good physical fitness and 4 with fair physical fitness. Participants with BMI status obesity I have 3 persons with good physical fitness, 5 persons with fair physical fitness, and 2 persons with poor physical fitness. Participants with BMI status obesity II has 3 persons with fair physical fitness, 1 with poor physical fitness, and 1 person with very poor physical fitness.

DISCUSSION

Regular physical activity has many benefits for the human body, including improved thinking, learning, and cognitive skills. Bodily active movement after every 1 to 2 hours sitting is

important for maintaining normal tone and elasticity of blood vessels and soft tissues[8]. Human biology requires a certain amount of physical activity to maintain good health and wellbeing and it would take many generations of biological adaptation to adjust to a sedentary lifestyle. Unfortunately, the average daily energy intake these days is increasing more than the daily energy output, creating an energy surplus. This condition contributes to the increasing number of overweight people and related health problems. Obesity is often linked to low levels of physical activity (PA) and sedentary habits. Studies show that obese and overweight individuals have lower health-related Physical Fitness (PF), sports activity hours, and Physical Activity levels. Normal-weight individuals were more likely to have superior results on PF tests and have more sports activity hours than obese participants[9]. Body Mass Index (BMI) is not an absolute indicator of obesity. Body Fat Percentage (BFP) has a greater ability to differentiate between lean mass and fat mass compared to BMI. Various studies support that BFP is strongly correlated with physical fitness and aerobic capacity[10]. The increase of BFP would have lower aerobic capacity. This condition is due to the increased fat deposition around the heart, which leads to overloading of the heart, and associated deterioration of heart functions is thought to reduce VO2 max[11–13]. Health-related physical fitness is also influenced by many other factors, such as total body fat and socioeconomic status. There are a few studies that discussed the association between body mass index (BMI) and several components of physical fitness in children and adolescents[14].

Regarding fitness and aging, several studies have described the so-called fitness age score to intuitively asses an individual's corresponding physical fitness age. The chronological age results that leg strength decreased by 29.74% from age 50 to age 80–87. There is a 20.0% decrease in strength performance when comparing the age range of 60 to 80 and above [15]. These present studies showed the existence of a significant difference in physical fitness associated with the aging process in strength (barbell), muscle endurance (swimming), and cardiorespiratory (running). Physical performance in all the evaluated tests varied between ages but with generally good results[16]. In our study, the elderly showed better physical fitness however 4 participants in the 19-44 years old group have poor PF. Physical fitness is a multidimensional construct, operationalized as a set of measurable health- and skill-related attributes or components, which can be assessed through exercise tests. Health-related physical fitness, achieved through regular exercise and/or spontaneous physical activity, confers physiological and psychological benefits and acts as a buffer against stress. Some previous studies provided important information about how physical fitness declines with age and its association with cognitive impairment, physical dependence, institutionalization, and death[17,18].

Physical activity and exercise can have both short-term and long-lasting effects. Studies have demonstrated that incorporating physical activity and exercise as a primary or secondary intervention can have a significant positive impact in preventing or alleviating symptoms of depression and may even have an antidepressant effect in individuals with neurological disorders. Engaging in regular exercise can improve one's quality of life by enhancing coping skills, reducing stress, and boosting self-esteem and social skills. The role of physical activity in preventing a wide range of chronic illnesses and premature death has been widely researched, with implications for various aspects of quality of life, including physical and mental health, and overall life satisfaction. There is ample evidence linking medical conditions such as cardiovascular disease to individual lifestyle behaviors, particularly a lack of exercise. It is therefore crucial to understand how to effectively increase self-efficacy towards physical activity to promote healthier lifestyle choices.

Physical activity and exercise can have both short-term and long-lasting effects. Recent studies demonstrated that incorporating physical activity and exercise as a primary or secondary intervention can have a significant positive impact in preventing or alleviating depressive symptoms and even have an antidepressant effect in people with neurological disorders. Training and exercising regularly can improve quality of life enhance coping skills and strengthen self-esteem and social skills[19]. The role of physical activity in preventing a wide range of chronic illnesses and premature mortality has been extensively examined and studied, affecting various aspects of quality of life, including physical and mental health status and life satisfaction. Adequate evidence links medical conditions such as cardiovascular disease and individual lifestyle behaviors, particularly lack of exercise. It is therefore crucial to how to improve self-efficacy towards physical exercise to promote healthier lifestyle choices[5,20].

CONCLUSION

Physical fitness supports our physical functions intact and supports other systems that are important in keeping the body healthy. Furthermore, it has significant positive effects in preventing or alleviating depressive symptoms and has an antidepressant effect. Physical activity helps to improve the quality of life and coping with stress and strengthens self-esteem and social skills[19]. Physical fitness is a multidimensional concept that includes measurable health and skill-related attributes. In our study, the elderly have better physical fitness than adults. According to BMI, none of the participants with BMI status underweight, normal weight, and overweight showed poor PF, while participants with obesity have poor and very poor PF. It may be concluded that regular physical activity helps to improve physical fitness in any level of age and BMI.

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