



## Consumption of Macronutrients, Body Mass Index, Smoking Status with Physical Fitness at Palembang Police District

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### ABSTRACT

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Physical fitness is the ability of the body to make adjustments to the physical burden given to members of the police in carrying out daily work without causing excessive fatigue and still be able to enjoy their free time. Components of physical fitness related to health and skills are cardiorespiratory, muscle endurance, muscle strength and body composition. The purpose of this study was to determine the relationship between macronutrient consumption, body mass index status, and smoking status with physical fitness at Palembang police district officers. Data of macro nutrients intake were collected using 24-hours recall. Physical fitness levels are measured using Cooper's way. The design of this study was Cross-sectional by taking a random sample of 56 male police officers. The analysis results using chi-square concluded that there is a relationship between energy intake, carbohydrate intake, with fitness level ( $p \leq 0.05$ ). There is a relationship between body mass index and smoking status, and physical fitness ( $p \leq 0.05$ ). There is no relationship between protein and fat intake with physical fitness status ( $p > 0.05$ ). The results of the multivariate analysis obtained the most dominant relationship with physical fitness levels is BMI status and smoking status. It is recommended that police members improve physical fitness status to take some exercises that are useful to enhance physical fitness levels, namely sit ups, push-ups, squat jumps to run or jogging regularly. Police officers control their ideal weight by eating a balanced diet and not smoking

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## 1. Introduction

Physical fitness can function effectively throughout work and still have enough energy to handle pressures or emergencies that may arise. This situation must be owned by a police officer, both physically, mentally and socially, in dealing with diverse work situations. The fitness component is cardiorespiratory, muscle strength, muscular endurance, flexibility, and body composition.

Physical fitness is influenced by several factors, including Body Mass Index (BMI), resting pulse, age, smoking and exercise that affect the performance of the Paskhas (Typical Forces as elite forces of the Indonesian Air Force) in carrying out the task. Data from Lakespra Saryanto during 2010 (January-December 2010 period) showed that the prevalence of overweight in the Paskhas population was around 15% [1].

Research about the relationship between BMI and aerobic safety scores in young adults in South Africa proves a significantly positive correlation with the lack of BMI values will increase the value of aerobic physical fitness ten times. In contrast, the greater the BMI will reduce the similarity of aerobics [2]. Another similar study on the effect of age on physical fitness with 210 members of the traffic police in Semarang found that police had 80.5% poor physical fitness while those with an excellent physical fitness level of 19.5% [3].

The law man performs very well physically and mentally but quickly to bekr and makes critical decisions in high stress conditions. Therefore, the ability of good physical health to perform optimally in their environment [4]. Health is the principal capital of police officers in carrying out their duties. Ideal health conditions can be seen directly with physical appearance, namely the balance between body weight and height [5].

Palembang district police is one of the police agencies that handle security in urban areas. Police members need good physical fitness in maintaining the security and order of Palembang city.

## 2. Method

This research is a survey research with a Cross-Sectional design. The sample of this study was male police when the measurement was not on duty in the field. Sample selection using simple random. Physical fitness levels are measured using Cooper's measuring a 12-minute road or non-stop run on a 400-metre track [6]. Macronutrient intake was assessed using 24-hour food recall. Statistical tests using chi-square with a significance level of 0.05. To obtain the most dominant relationship to the level of physical fitness using logistic binary regression test.

## 3. Result and Discussion

Macro nutrient consumption data in respondents was analyzed using Indonesian food composition table and a list of food ingredient composition, then compared to recommended dietary allowed (RDA) for Indonesians. Data processing of physical fitness level by grouping the scores obtained by comparing fitness levels according to Cooper. The results of measurements of 56 respondents mean age was  $29.09 \pm 6.04$  years. The average energy consumption in respondents was  $2,441.8 \pm 560.3$  calories. The mean protein consumption was  $73.9 \pm 18.2$  grams. The mean fat consumption was  $88.2 \pm 33.7$  grams. The mean carbohydrate is  $342.1 \pm 93.9$  grams. The mean body mass index was  $24.0 \pm 2.7$  kg/m<sup>2</sup>. The mean physical fitness test score is  $2,575.0 \pm 710$  meters. Respondents smoking habits were 53.6% and non-smoking 46.4%.

The results of statistical tests with chi-square obtained a significant relationship between energy consumption ( $p=0.015$ ) and carbohydrate consumption ( $p = 0.013$ ) with the level of

physical fitness. There was no meaningful relationship between protein consumption ( $p=0.645$ ) and fat consumption ( $p = 0.416$ ) with the level of physical fitness—the complete results of the study as in table 1.

Energy consumption of adequate food is necessary to cover the energy expenditure of a person who has the size and composition of the body with a level of activity by long-term health [7]. In the study, Ananta (2018) stated there is a relationship between physical fitness with energy intake in the Yonif mechanical Raider army [8]. The respondent's energy intake was good enough. It is known from interviews with respondents, only some respondents eat breakfast most of the breakfast in the cafeteria compared to home, and most respondents consume foods high in carbohydrates.

Based on the results of statistical tests using chi square test obtained value  $p=0.0001$ , it can be concluded that in this study, there is a relationship between BMI status and physical fitness. Being overweight will increase BMI to affect aerobic fitness value; BMI is the most crucial factor predicting failure in military physical readiness tests. The exact correlation was found in several studies. Respondents with a normal BMI have good fitness and no obstacles when running in contrast to respondents who have normal BMI status, and overweight BMI status can decrease cardiorespiratory endurance, which impacts reducing the running distance for 12 minutes.

Based on the results of statistical tests using Chi Square to test the relationship of smoking with physical fitness level, obtained a value of  $p= 0.005$ , it can be concluded that in this study, there is a relationship between smoking habits and physical fitness levels [9]. Smokers police members had a much lower fitness score ( $P \leq 0.05$ ) in sitting and achieved flexibility, sit-up resistance, bench press strength and cardiovascular endurance of bicycle ergometers [10]. Carbon monoxide gas produced from smoking habit reaches 3-6%, which can bind hemoglobin (Hb) in red blood cells (erythrocytes) stronger than oxygen so that the body cells that suffer from oxygen deficiency. The deficiency of oxygen in the body will affect physical fitness [11]. The smoking habit in police members is mainly in the smoking category. This is known from the respondent's interview, showing that respondents with a tradition of not smoking had a good level of physical fitness seen during the running test.

**Table 1. Distribution of Physical Fitness by Energy Consumption, Smoking Status and BMI status**

	Physical Fitness level				Total	p-value	
	Good		Average				
Energy consumption	n	%	n	%	n	%	
More than (>110 % RDA)	2	20.0	8	80.0	10	100	0.015
Between (80 – 110 % RDA)	18	69.2	8	30.8	26	100	
Less than (<80 % RDA)	14	70.0	6	30.0	20	100	
	34	60.7	22	39.3	56	100	
Protein consumption							0.645
More than (>110 % RDA)	19	59.4	13	40.6	32	100	
Between (80 – 110 % RDA)	11	57.9	8	42.1	19	100	
Less than (<80 % RDA)	4	60.7	1	20.0	5	100	
	34	60.7	22	39.9	56	100	
Fat consumption							0.416
More than (>110 % RDA)	11	50.0	11	50.0	22	100	
Between (80 – 110 % RDA)	10	66.7	5	33.3	15	100	
Less than (<80 % RDA)	13	68.4	6	31.6	19	100	
	34	60.7	22	39.3	56	100	
Carbohydrate consumption							0.013
More than (>110 % RDA)	4	28.6	10	71.4	14	100	
Between (80 – 110 % RDA)	17	77.3	5	22.7	22	100	
Less than (<80 % RDA)	13	65.0	7	35.0	20	100	
	34	60.7	22	39.3	56	100	
Smoking status							0.010
Yes	21	80.8	5	19.2	26	100	
No	13	43.3	17	56.7	30	100	
	34	60.7	22	39.3	56	100	
Status BMI (kg/m <sup>2</sup> )							0.0001
Normal (>18,5 – 25,0)	33	78.6	9	21.4	42	100	
Overweight (> 25,0)	1	7.1	13	92.9	14	100	
	34	60.7	22	39.3	56	100	

Furthermore, to determine which variables were more dominant regarding physical fitness levels in police members, a multivariate regression logical test was conducted—multivariate analysis results as in table 2.

**Table 2. Logistics regression multivariate analysis model**

Variabel	B	OR	95 % Confidence Interval	p value
Smoking status				
No	2.68	1	1.68 – 126.50	0.015
Yes		14.58		
BMI level (Kg/m <sup>2</sup> )				
Normal (>18,5 – 25,0)	4.69	1	7.03 – 1701.49	0.001
Overweight (> 25,0)		109.39		

The results of the statistic test against variables that are meaningful with physical fitness, after a statistic test with a multivariate regression logistic obtained that smoking status and dominant BMI levels are related to the respondent's physical fitness level. Respondents' smoking habits had a 14.58 times lower risk of lowering their physical fitness levels than non-smoking habits. BMI levels in the overweight category of respondents can decrease physical fitness levels by 109.39 times compared to normal BMI levels

## 1. Conclusion

The physical fitness level of Palembang Police officers is 60.7% good, and 39.3% meets the standards. The average energy intake is 2,441.8 calories, and some 46.4% already meet the recommended rate. The lifetime index status of the body is 75% normal, and 25% overweight. The level of fitness of police officers is influenced by body mass index status and smoking status. BMI status has the most significant contributing factor to the physical fitness of police officers.

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