

LIFESTYLE AND POTENTIAL FISH

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LIFESTYLE AND POTENTIAL OF FISH CONSUMPTION ON THE PEOPLE OF HEALTH IN PRAMUKA ISLAND, INDONESIA

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ABSTRACT

The aim of this research is to find a healthy lifestyle effect after consumption of fish on the island pramuka, thousand islands. This research is an observational study with a cross-sectional study approach with the subjects from various professions with a sample population of men and women aged 35-60 years. The method in this study begins with observing the problem, then continues to examine the circumference of the stomach, height, weight, and examination of blood glucose, blood cholesterol, blood uric acid, and is equipped with an IPAQ questionnaire, 24 hours food recall and interviews. In the results of this study, blood glucose levels were influenced by physical activity and carbohydrate intake, blood cholesterol levels were influenced by PUFA and sodium, blood uric acid levels were influenced by physical activity, PUFA, sodium, potassium, and zinc. Information was obtained that the people of Pramuka Island utilize a variety of fish for consumption which can affect good health conditions.

Keywords: Fish, Fish Consumption, PUFA, Metabolic Syndrome

I. INTRODUCTION

Every year non-communicable disease (NCD) cases continue to increase. According to WHO, the main NCD is stroke, cardiovascular disease, diabetes, and chronic respiratory disease. Several NCD in Indonesia, based on the Basic Health Research 2018 have a tendency to increase in prevalence such as cancer, chronic kidney disease, stroke, hypertension, and diabetes mellitus, from 2013 to 2018 [1]. A collection of risk factors that can increase incidence of stroke, cardiovascular disease, diabetes, and other health problems is metabolic syndrome. Metabolic syndrome is associated with an increased risk of type 2 diabetes mellitus and cardiovascular disease [2].

Based on research by Sirait [3] in the age group of 25-65 years who experience metabolic syndrome is 18.7%. These various studies can be seen, especially in the productive age group, that metabolic syndrome has a fairly high prevalence in the world to Indonesia.

Metabolic syndrome has a prevalence of up to 23% in Indonesia. Description of Basic Health Research 2018 on several health conditions related to metabolic syndrome, including an increase in the proportion of obesity in adulthood by 21.8%.

Central obesity can be determined by measuring the ratio of abdominal circumference, central obesity is also known as visceral obesity or abdominal obesity [4]. Serum uric acid levels are also frequently associated with obesity and a risk factor for hyperuricemia.

People with negative lifestyle such as lazy behavior / sedentary behavior and unhealthy food intake is one of the causes of metabolic syndrome. 33% of Indonesia's population has insufficient physical activity, and 95% less consumption of nutrition [1]. Inadequate dietary intake also affects the incidence of NCD. Food intake can be measured by two types of consumption data, Methods that can be used include the method of dietary history, food frequency, and food list. The second is quantitative, usually, the amount of food can be determined using the

List of Food Ingredients (LFI/DKBM). DKBM methods that can be used include the 24-hour food recall method, food weighing, estimated food records, household food records, inventory methods, and food accounts [5].

One of the ways to get food nutrition is with fish consumption. Fish have great potential components that are very benefit to human health. the compounds found in fish such as fat, protein, vitamins, carotenoids, minerals, omega-3, taurine [6,7].

The high nutritional content of fish as a source of fat with omega-3 can reduce cardiovascular risk [6]. Fish that is consumed can protect people from NCD which is caused by changes in lifestyle in the world's industrialized countries [7].

Many researchers claim that the habit of eating fish has a protective effect on the risk of cardiovascular disease. Fish has many benefits from its nutritional content, especially unsaturated fatty acids, which have the function of slowing down the process of arteriosclerosis by reducing cholesterol levels [8].

Of the thousands of islands throughout Indonesia that are scattered, there is the Thousand Islands which are located in the DKI Jakarta Province. The main activities in the people of The Pramuka Island community around the coral reef ecosystem in the national park area include fisheries and marine tourism activities. This indicates the high level of community dependence on fishery resources [9]. In the people of The Pramuka Island has the opportunity to get a lot of fish and consume them so that the people of The Pramuka Island can avoid the occurrence of atherosclerosis which can cause cardiovascular disease.

Physical activity if done regularly can be useful for strengthening the blood vessel system and heart and controlling body weight. By changing jobs, more tools, and machines that facilitate household chores, free time, and the advancement of tourism and transportation can reduce physical activity [10]. The negative lifestyle of the community, such as the habit of drinking flavored drinks, soft drinks, lack of exercise, eating high carbohydrate foods will lead to obesity and can lead to metabolic syndrome. This condition is very interesting to study because no one has researched the relationship between lifestyle, physical activity, and food and beverage intake with the health conditions of The Pramuka Island community.

The purpose of this study was to determine the effect of lifestyle and food and beverage intake on the examination of blood glucose, cholesterol, and uric acid in the people of the Pramuka Island. The diversity of fish consumed by the people of The Pramuka Island. The effect of fish consumption on the results of blood glucose, blood cholesterol, and blood uric acid tests.

The benefits of this research are as a basis for consideration in maintaining the environmental health of coastal communities and showing the benefits of marine biodiversity. With this research, the community can also understand the benefits of fish for health so that the diversity of fish can be maintained so that its benefits can be enjoyed from generation to generation.

II. MATERIALS AND METHODS

This research is an observational study with a cross-sectional study approach to finding the influence between the dependent variable/effect and the independent variable/risk factor with a measure that is carried out for a moment [11]. the sample population of men and women aged 35 - 60 years.

The tools and materials needed in this study include punch pens, sticky needles, blood glucose measuring devices (AccuChek meters, glucose strips), cholesterol and uric acid measuring devices (EasyTouch meters, cholesterol strips, uric acid strips), questionnaires, stethoscope, tension meter, abdominal circumference meter, height measurement, body scales.

Procedure

Starting with the research patient, the abdominal circumference, height, and weight were examined, then blood glucose was checked with the AccuChek device produced in the city of Mannheim, Germany. The patient was checked for blood cholesterol and blood uric acid using the EasyTouch device produced at Biopitik Technology Inc., Taiwan, and the patient then filled out the IPAQ method questionnaire to determine their physical activity on the previous 7 days. Patients were interviewed with a 24-hour food recall to determine the amount and type of

food consumption, including fresh fish consumed. The patient was interviewed about everything about fish consumption such as where fish was obtained, types of fish, and others.

The lifestyle of the people of Pramuka Island is described with the IPAQ method. The food and beverage intake of The Pramuka Island people obtained from the average results of the first month with the third month of the 24-hour food recall and data on the frequency of food consumed for one month.

III. RESULTS

Characteristics of Subject

In this study, there were as many as 95 subjects, from various ages, sexes, BMI with the criteria said to be obese if $\geq 25 \text{ kg} / \text{m}^2$, the abdominal circumference with the criteria was said to be obese if the cut off point was 80 cm for women and 90 cm for men and

Based on data the age of the subjects was from 30 years to 52 years with a mean age of 41 ± 11 years. There are 68% of subjects categorized as obese with a body mass index of $27 \pm 6 \text{ kg} / \text{m}^2$ and a stomach circumference of 91 ± 12 cm. Researchers get the most subjects with housewives by 54% while fishermen are only 2%. Based on the interviews conducted, it was found that most of the fishermen on The Pramuka Island switched professions to become tour guides so that the number of fishermen on The Pramuka Island was less than other densely populated islands such as Baked Island.

The Pramuka Island Community Physical Activities

The lifestyle of the Pramuka Island community is depicted from the physical activity data of the subjects. Based on the data, it was found that 26% of the subjects did light activity and 17% of the subjects did strenuous activities. Pramuka Island community activity is dominated by moderate activity at 57% so that it can affect health conditions towards obesity.

The Pramuka Island Community Food and Beverage Intake

The food and beverage intake of the Pramuka Island community is described from the nutritional intake of food and beverage consumed by the subject,

Based on the data, it was found that 70% of subjects had adequate protein, 85% PUFA adequacy, 78% vitamin A adequacy, 64% vitamin B sufficiency, 71% vitamin C adequacy, 76% phosphorus adequacy, 58% had excess carbohydrate intake, 56% had excess fat intake, 100% excess cholesterol intake.

Subjects who have 100% less nutritional intake for water needs, this is because there has not been a survey on the volume of mineral water intake, 100% less nutritional intake, 85% to 86% were also found for carotin, fiber and total folic acid needs, 71% up to 78% for the needs of vitamin E, sodium, potassium and calcium, 58% to 68% for energy needs, vitamin B1, vitamin B2, iron and zinc where this lack of nutritional intake is mostly found in the intake of vegetables and fruits. fruits so that the people of Pramuka Island need to increase their need to eat vegetables and fruits.

Levels of examination of blood glucose, blood cholesterol, and blood uric acid in The Pramuka Island Community

Dyslipidemia, hyperglycemia, and hyperuricemia are metabolic syndrome conditions that can be checked by checking blood glucose levels, blood cholesterol levels, and blood uric acid levels. Blood tests can help control your health so that metabolic syndrome does not occur.

Based on data as many as 59% of the subjects had blood glucose levels $> 100 \text{ mg/dl}$, this could put The Pramuka Island community at risk of hyperglycemia and obesity. As many as 79% of subjects had blood cholesterol levels $\leq 200 \text{ mg/dl}$, this is useful for preventing dyslipidemia and obesity. As many as 77% of subjects had blood uric acid levels $\leq 7.2 \text{ mg/dl}$ for men and $\leq 6 \text{ mg/dl}$ for women, this is useful for preventing hyperuricemia and obesity.

The Effect of Lifestyle and Food and Beverage Intake of The Pramuka Island Community on the Results of Blood Glucose, Blood Cholesterol, and Blood Uric Acid Examination

The influence of lifestyle and food and beverage intake of The Pramuka Island community on the results of blood glucose, blood cholesterol, blood uric acid tests is illustrated by the correlation between lifestyle and nutritional

intake consumed by the subjects and the results of the subjects' blood glucose, blood cholesterol, blood uric acid as listed in (table 1).

Table 1. Correlation of Physical Activity and Nutritional Intake of Subjects to the Subject's Blood Glucose, Blood Cholesterol, Blood Uric Acid Results

		Variabel Dependent					
		Blood Glukose		Blood Cholesterol		Blood Uric Acid	
		T Count	Significance	T Count	Significance	T Count	Significance
	(Constant)	3,457	0,001	12,634	0,000	6,238	0,000
Lifestyle	Physical activity	-	0,011	-0,894	0,374	2,338	0,022
	Smoke	0,047	0,963	0,109	0,914	0,935	0,353
Variable Independent Nutritional Intake	Energy	0,111	0,912	0,231	0,818	-0,503	0,617
	Protein	1,225	0,225	0,343	0,733	-1,885	0,064
	Fat	-	0,914	-0,277	0,783	-0,141	0,888
	Carbohidrat	2,288	0,025	-0,059	0,953	0,218	0,828
	Fiber	0,005	0,996	0,102	0,919	1,038	0,303
	PUFA	1,690	0,095	-7,311	0,000	-2,847	0,006
	Vitamin A	-	0,237	1,578	0,119	0,555	0,581
	Vitamin E	0,042	0,966	-0,323	0,747	1,868	0,066
	Vitamin B1	-	0,794	0,746	0,458	-0,012	0,990
	Vitamin B2	-	0,896	-0,271	0,787	1,249	0,216
	Vitamin B6	-	0,982	-0,696	0,488	0,886	0,379
	Folic Acid	-	0,315	1,180	0,242	-1,151	0,254
	Vitamin C	-	0,547	0,364	0,717	-0,875	0,384
	Sodium	0,606	0,403	-2,629	0,011	-2,137	0,036
	Potasium	0,842	0,825	0,154	0,878	-2,050	0,044
	Calcium	0,222	0,550	1,135	0,260	0,888	0,378
	Magnesium	0,601	0,912	-1,050	0,297	-1,199	0,234
	Phosphor	0,110	0,383	-0,795	0,429	1,049	0,298
	Iron	-	0,600	0,738	0,463	1,807	0,075
	Zink	0,526	0,366	0,280	0,780	2,166	0,034

Based on (table 1), it is known that there is a significant effect between physical activity and carbohydrates on blood glucose levels, between PUFA and sodium on blood cholesterol results, between physical activity, PUFA, sodium, potassium with zinc on blood uric acid levels (<0.05).

Diversity of Fish Consumed by The Pramuka Island Community

The diversity of fish consumed by The Pramuka Island community is depicted from the fish consumed by the subjects for one month as shown in (table 2).

Table 2. Fish Consumption of Subjects

Local Name	Mean ± SD	Percentase (%)	Other Name	Seasons
Kerapu (g)	237,79±468	7,78	Grouper	Throughout the year
Baronang (g)	184,74±339	6,04	Rabbitfish	Feb – March Nov - Dec
Tongkol (g)	800,53±609	26,19	Kawakawa, little tuna, mackerel tuna, atau false albacore	October - April.
Tengiri (g)	55,42±196	1,81	Soliter	Nov - Dec
Ekor Kuning (g)	172,42±388	5,64	Sulu, sulih, suliri, sunin	Throughout the year
Cucut (g)	10,42±19	0,34	Shark	Mey - July
Kembung (g)	342±528	11,19	Indian mackerel	June -Feb,
Selar (g)	136,89±348	4,48	Yellowstripe scad, yellowstripe trevally	July - March.
Kakap (g)	70,58±236	2,31	Red Snapper	Feb - August
Tembang (g)	83,84±270	2,74	Sardine fish	Feb - Nov
Bandeng (g)	196,11±423	6,41	Chanos chanos	Cultivation
Ikan Sarden (g)	180,95±406	5,92	Sardine fish	Feb-Nov
Ikan selain di atas (g)	452,84±614	14,81		
Total Konsumsi Ikan (g)	3152,84±2757	100		

Based on (table 2) the people of The Pramuka Island consume fish with an average of 3152.84 ± 2757 grams per month, this shows that the people of The Pramuka Island use the diversity of fish for consumption. Most of the fish consumed by the people of The Pramuka Island are tongkol by 26% compared to other fish. The fish that is least consumed by the people of The Pramuka Island is cucut by 0.34% compared to other fish.

Apart from tongkol, kembung is often consumed by the people of The Pramuka Island at 11.19% compared to other fish. Kerapu, bandeng, and baronang are also quite often consumed by the island community, groupers are consumed by 7.78%. Bandeng consumed was 6.41%, while the baronang consumed is 6.04 %.

Effect of Fish Consumption on Examination of Blood Glucose, Blood Cholesterol, Blood Uric Acid

The effect of fish consumption by The Pramuka Island community on the results of blood glucose, blood cholesterol, blood uric acid tests is illustrated by the correlation between the nutritional intake of fish consumed by the subjects and the results of the subjects' blood glucose as listed in (table 3).

Table 3. Correlation of Subject Fish Consumption on Blood Glucose, Blood Cholesterol, Blood Uric Acid

Independent Variable	Dependent Variable					
	Blood glucose		Blood Cholesterol		Blood Uric Acid	
	T count	Significance	T count	Significance	T count	Significance
(Constant)	-	0,871	6,873	0,000	4,324	0,000
PUFA	0,936	0,352	-	0,004	-	0,306
Cholesterol fish	-	0,894	0,393	0,695	0,065	0,948
Phosphor	3,232	0,002	1,387	0,169	1,073	0,286

Based on (table 3), it is known that there is a significant effect between the phosphorus content in fish on blood glucose levels (<0.05). Based on (table 10), it is known that there is a significant effect between the phosphorus

content in fish on blood glucose levels, PUFA content in fish on blood cholesterol levels and there is no significant effect between nutritional intake from fish consumption on blood uric acid levels.

IV. DISCUSSION

The Effect of Lifestyle and Food and Beverage Intake of The Pramuka Island Community on the Results of Blood Glucose, Blood Cholesterol, and Blood Uric Acid Examination

Physical activity and stress are non-nutritional factors that are risk factors for metabolic syndrome. Excessive food intake has consequences obesity which is a risk factor for other diseases, such as non-insulin-dependent diabetes mellitus [12].

In the insufficient physical activity, nutrients in the body are not burned but are stored in the body to become fat and glucose. If insufficient insulin is required to convert glucose into energy, blood glucose levels can increase [13].

In this study, it was found that energy intake was less, this is in line with Siahaan's [14] study where energy intake did not affect increasing blood glucose levels directly. The condition of blood glucose levels is influenced by carbohydrate intake, carbohydrates in the body are converted into glucose that is soluble in the bloodstream, so that excess carbohydrate intake can increase glucose levels in the blood [15]. Soleha [16] stated in his research on the relationship between metabolic syndrome and cardiovascular disease that dysregulation of glucose metabolism can lead to dyslipidemia and uric acid metabolism disorders. So that an increase in blood glucose levels will also increase blood cholesterol levels and blood uric acid levels.

This is not in line with the study of Soleha [16] which states that an increase in blood glucose levels is accompanied by binding to cholesterol levels. This condition of not increasing cholesterol levels can be caused by an adequate intake of PUFAs and not excessive sodium intake.

Sodium is needed by the body to carry out its functions. The kidneys retain sodium when the body is deficient in sodium and vice versa will excrete it through urine when it is excess, but when kidney function is not optimal it cannot be removed and a buildup occurs in the blood. Adequate and not excessive sodium intake will be able to prevent hypertension by being accompanied by normal cholesterol levels.

Physical activity is one of the factors that can affect blood uric acid levels. Activities such as physical movement or exercise can reduce uric acid expression, thereby increasing the production of lactic acid in the body. Some studies suggest that strenuous activity can aggravate gout, as indicated by an increase in blood uric acid levels. Lactic acid will cause uric acid secreted by the kidneys to decrease, resulting in a buildup of uric acid [17]. In this study, participants with normal uric acid levels had moderate physical activity.

Uric acid can dissolve as sodium urate in plasma when the blood pH is at an alkaline level. If the pH has decreased like a dehydrated condition, the uric acid becomes difficult to dissolve and can precipitate into sharp crystals. In this condition, the body can use sodium, potassium, zinc and other minerals in the joints of the body to restore the pH of the blood to an alkaline level.

Diversity of Fish Consumed by The Pramuka Island Community

Most of the fish consumed are tongkol, this is due to the time the research was conducted in February where tongkol, which is a pelagic fish, migrates across Java Sea waters from October to April [18]. Tongkol has high economic value with the advantages of high protein and omega 3. So that tuna becomes a fish that is in great demand by the public.

The fish that is least consumed is cutut. This is because cutut are mostly found in May to July and because of their beauty, young cutut are more used as ornamental fish [18]. Kembung can also be found in the waters of the Thousand Islands from June to February [19]. kerapu can be found in the waters of the Thousand Islands throughout the year [18]. Based on the results of the interview, it was found that bandeng consumed was the result of cultivation on The Pramuka Island, but currently fishermen also often get bandeng from catches at sea.

Baronang can be found in the waters of the Thousand Islands from February to March [18]. Based on the results of the interview, the researcher obtained information that the fish obtained by the The Pramuka Island community

came from fishermen directly after the fishermen had finished fishing. Besides, fishermen have also used technology in conducting fish sales transactions, one of which is by using online social media. As many as 14.81% of fish other than the above which could not be categorized as a percentage based on the results of the interview were cendro, ela-ela, tengkek, bull, como, barracuda, bentong, kurisi, Callala, blaknak and still many other types of fish.

Effect of Fish Consumption on Examination of Blood Glucose, Blood Cholesterol, Blood Uric Acid

Phosphorous stimulates protein metabolism and helps the body utilize carbohydrates throughout the body so that blood glucose does not accumulate.

Fish contains a lot of nutrients, especially minerals, protein, and fat is the largest producer of PUFA which is beneficial for health [20]. PUFA can improve heart health because it has a good effect on blood cholesterol and can reduce blood viscosity [21]. The good effect of PUFA is by lowering the cholesterol level in the blood [22]. The effect of PUFAs in reducing blood cholesterol is caused by increasing HDL levels and decreasing LDL levels. PUFAs are needed by the body to reduce the risk of blockage of blood vessels, coronary heart disease, and have an autoinflammatory effect [23]. Several studies have shown that consuming fish can protect humans from diseases caused by lifestyle changes in various industrialized countries in the world [7].

V. CONCLUSIONS

Based on the results of the research we can concluded that a lifestyle with moderate physical activity and intake of food and beverages containing sufficient to excess carbohydrates are known to have a significant effect with an increase in blood glucose levels and those containing sufficient PUFA, low sodium, potassium, zinc are known to have a significant effect with no increase in blood uric acid levels. The intake of food and beverages containing sufficient PUFA and low sodium is known to have a significant effect on the absence of an increase in blood cholesterol levels. There are more than 23 types of fish products that are consumed by the community as the utilization of fish diversity. Consumption of fish containing phosphorus is known to have a significant effect with an increase in blood glucose levels and those containing PUFA are known to have a significant effect on the increase of an increase in blood cholesterol levels, because the PUFA content of fish can be useful in preventing an increase in blood cholesterol levels.

This research is in line with the GEMARIKAN program (fond of promoting fish-eating) so that people consume fish to improve nutrition from an early age, given the good nutritional content found in fish as a source of protein. For this reason, a wider promotion is carried out considering the positive results of eating fish.

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