

Factors Influence level of Cholesterol, Triglyceride, LDL, HDL on Military and Civil Servants in the Navy Military National of Indonesia, Jayapura

Janri Manullang¹, A.L. Rantetampang², Yacob Ruru³, Anwar Mallongi⁴

¹Magister Program of Public Health, Faculty of Public Health, Cenderawasih University, Jayapura.

^{2,3}Lecturer of Master Program in Public Health. Faculty of Public Health, Cenderawasih University, Jayapura

⁴Environmental Health Department, Faculty of Public Health, Hasanuddin University, Makassar

Corresponding Author: Janri Manullang

ABSTRACT

Background: The number one cause of death in Papua every year is cardiovascular disease. Some factors that affect cardiovascular disease such as coronary heart disease are cholesterol, triglyceride, low density lipid (LDL) and high density lipid (HDL)

Objective: To aim the effect of age, sex, diet, smoking behavior, BMI, waist circumference on cholesterol, triglyceride, LDL, HDL levels in the blood of military and civil servants measuring spectrophotometer 5010 at Navy Hospital Dr. SoedibjoSardadi, Jayapura

Method: Descriptive study with cross sectional design. This research was performed in November until December 2017 in Navy Hospital of Dr. SoedibjoSardadi, using 100 samples. Data was obtained using questionnaire form and being analyzed using SPSS.

Result: Factors that have a significant influence on this study are based on questionnaire with chi square test statistics, consist of the relationship between smoking Active with LDL with the strength of the relationship that is active smoking twice possibility of experience hypercholesterolemia, smoking more than 10 years with LDL levels, exercising daily with triglyceride levels, exercising ≥ 60 minutes a day with triglyceride levels, female sex with LDL levels, eating habits fried <3 times a week with triglyceride levels.

Keywords: cholesterol, triglyceride, LDL, HDL

1. INTRODUCTION

Australians aged 45 years and over are at 90% more at risk of developing cardiovascular disease so that lipid profile

screening needs to be done at least once every 5 years, while the age limit for screening for Aboriginal and indigenous populations in Torres Strait Island is 35 years and over. Based on US Preventive Services Task Force (USPSTF) guidelines, men aged 35 years and over and women aged 45 years and over are strongly advised to undergo routine screening for lipid profiles. The prevalence of heart failure based on a doctor's diagnosis in Indonesia was 0.13 percent, and based on a doctor's diagnosis or symptoms of 0.3 percent. The prevalence of stroke in Indonesia as much as 57.9 percent of stroke has been diagnosed by health professionals. The prevalence of coronary heart disease, heart failure, and stroke is seen to increase as the respondent ages. The prevalence of stroke is as much as in men and women. (Riskesdas, 2013)

In Papua the number one cause of death every year is cardiovascular disease. Cardiovascular disease is a disease caused by heart and blood vessel dysfunction, such as: Coronary Heart Disease, Heart Failure or Heart Disease, Hypertension and Stroke. In 2008 an estimated 17.3 million deaths were caused by cardiovascular disease. More than 3 million deaths occurred before the age of 60 years and should be prevented. "Early" deaths caused by heart disease occur in the range of 4% in high-income countries up to 42% in low-income countries. Hypertension complication causes around 9.4 deaths worldwide every year. Hypertension causes at least 45% of deaths due to heart disease

and 51% of deaths due to stroke. Death caused by cardiovascular disease, especially coronary heart disease and stroke is expected to continue to increase to 23.3 million deaths in 2030. (Riskesdas, 2013)

Cholesterol is the most important element that is very basic in the process of calcification of the coronary arteries and the possibility of coronary heart disease is actually going to decrease proportionally 2% for each decrease of 1% cholesterol from the original level. Cholesterol can stick to the inner surface of the walls of the coronary vessels, which are similar to rust which is thickened in the groove of an iron pipe that has long been dormant. This process is known as atherosclerosis (Baraas, F, 1999). Cholesterol must be controlled routinely, especially if someone starts to grow up, because the process of atherosclerosis has actually begun to occur secretly from a young age. If normal cholesterol, further examination is done once a year. But if cholesterol is high enough, the examination must be carried out every three months to evaluate all the control efforts carried out so far. If necessary, the examination is repeated every month, if the cholesterol level is very high (Anderson, 1990).

According to data from the Ministry of Health, heart disease in Indonesia has increased from year to year. Some factors thought to be triggers for heart disease include obesity, because of the increase in BMI which causes an increase in the body's metabolic function which requires a greater supply of oxygen, so that the workload of the heart muscle increases (Basha 1994). High cholesterol is also a trigger factor for coronary heart disease because high cholesterol causes blockage in the peripheral vessels which reduces blood supply to the heart. High cholesterol can also be a trigger for hypertension and stroke. (Miranti, Yeni, 2008)

Another factor that is allegedly related is smoking because smoking can cause vasoconstriction of the heart muscle which can reduce the carrying capacity of

oxygen throughout the body (supriyono). Balanced and continuous physical activity can train the heart muscle; besides physical activity like exercise can burn visceral fat which can interfere with the heart muscle. (ShabelaRifdah. 2012)

2. MATERIALS AND METHODS

2.1 Design / type of research

Cross sectional study design. This type of research is descriptive research, this study included research subjects with age preferences in the population related to prevalence at the age of age. (Soekidjo Notoatmodjo, 2012)

2.2 Research Location & study time.

The study was conducted at the Navy Hospital Dr. Soedibjo Sardadi, Jayapura. The research was carried out in November - December 2017.

2.3 Population and Sample

The population is all members of Lantamal X Jayapura. The sampling technique is taken randomly with a simple sample size with Inclusion criteria:

- Age (20 - 60)
 - Willing to take blood samples
- Exclusion Criteria: - Pregnant.
- Not willing to take blood

2.4 Data Collection Techniques

Data collection techniques are divided into 2, namely the method of determining the sample and the method of collecting data in the field. Field data retrieval is divided into questionnaire method, method of measuring body weight, height, method of taking venous blood and methods of measuring cholesterol.

2.5. Data Analysis Techniques

Univariate

Performed on each variable of the research results by using the table of frequency distribution and proportion of each research variable.

Bivariate analysis

To determine the relationship between independent and dependent variables using the Chi-Square test.

3. RESULTS

3.1. General description of Lantamal X personnel

Military personnel, ANS and family development on health is carried out with close supervision by the upper command level (Chief of the navy staff) through a circular letter and implemented and is a work program of spers activities carried out by the health department and the physical administration department of Lantamal X by determining the time and day of exercise that must be carried out for the purpose of improving / maintaining the physical condition of the body and controlling the condition, physical abilities of each personnel. The work program of the physical field administration service Lantamal X conducted the tests per semester

(per 6 months) with the aim of monitoring the health condition of X's personnel, which was carried out, namely running in 12 minutes, restock, sit ups, pussy up. The health office has routine personnel (Urikes) health screening programs per semester (per 3 months) to monitor and monitor the health of personnel where the work program can determine the health conditions of personnel physically and spiritually.

Lantamal X has sports facilities for personnel and families fitness equipment, restock, badminton court, futsal court, foot soccer field, archery field, volleyball court and residence / residential safe personnel, fresh air, away from public highways where it is wrong one cause of environmental population.

3.2 Bivariate Analysis

Table 1 Relationship of gender with cholesterol, triglyceride, LDL, HDL values (n = 100)

Jeniskelamin	Kolesterol				Trigliserida (> 200 mg/ml)				LDL (>100 mg/ml)				HDL (< 60 mg/ml)			
	< 200 mg/ml		> 200 mg/ml		< 200 mg/ml		> 200 mg/ml		<100 mg/ml		>100 mg/ml		<60 mg/ml		>60 mg/ml	
Laki-Laki	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%
	43	81.1	10	18.9	33	62.3	20	37.7	29	54.7	24	45.3	0	0	53	10.0
Perempuan	40	85.1	7	14.9	38	80.9	9	19.1	15	31.9	32	60.1	1	2.1	46	97.9
P.value	P=0.794				P=0.794				P=0.037				p=0.470			

Table 2. Exercise relationships ≥ 60 minutes a day with cholesterol, triglyceride, LDL, HDL values (n = 100)

berolahraga ≥ 60 menitsehari	Kolesterol				Trigliserida				LDL				HDL			
	< 200 mg/ml		> 200 mg/ml		< 200 mg/ml		> 200 mg/ml		<100 mg/ml		>100 mg/ml		<60 mg/ml		>60 mg/ml	
tidak	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%
	54	80.6	13	19.4	45	67.2	22	32.8	29	43.3	38	56.7	1	1.5	66	98.5
ya	29	87.9	4	12.1	26	78.8	7	21.2	15	45.5	18	54.5	0	0	33	100
P.value	P.0.530				P. 0.03				P.1.000				P.1.000			

Table 3, The usual relationship of exercising in a week with cholesterol, triglyceride, LDL, HDL values (n = 100)

tidak	Kolesterol				Trigliserida				LDL				HDL			
	< 200 mg/ml		> 200 mg/ml		< 200 mg/ml		> 200 mg/ml		<100 mg/ml		>100 mg/ml		<60 mg/ml		>60 mg/ml	
ya	n	%	n	%	N	%	n	%	n	%	n	%	n	%	n	%
	16	76.2	5	23.8	14	66.7	7	33.3	11	52.4	10	47.6	0	0	21	100
ya	67	84.8	12	15.2	57	72.2	22	27.8	33	41.8	46	58.2	1	1.3	78	98.7
P.value	p 0.343				p 0.824				p 0.533				p 1.000			

Table 4. Relationship of Smoking > 10 Years with cholesterol, triglycerides, LDL, HDL values (n = 100)

Merokok > 10 Tahun	Kolesterol				Trigliserida				LDL				HDL			
	< 200 mg/ml		> 200 mg/ml		< 200 mg/ml		> 200 mg/ml		<100 mg/ml		>100 mg/ml		<60 mg/ml		>60 mg/ml	
tidak	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%
	22	84.6	4	15.4	16	61.5	10	38.5	16	61.5	10	38.5	0	0	26	100
ya	61	82.4	13	17.5	55	74.3	19	25.7	28	37.8	46	62.2	1	1.4	73	98.6
P.value	p 1.000				p 0.325				P 0.048				p 1.000			

Table 5. Relationship between fried foods <3 times a week with cholesterol, triglycerides, LDL, HDL values (n = 100)

Makangorengan< 3 kali seminggu	Kolesterol				Trigliserida				LDL				HDL			
	< 200 mg/ml		> 200 mg/ml		< 200 mg/ml		> 200 mg/ml		<100 mg/ml		>100 mg/ml		<60 mg/ml		>60 mg/ml	
tidak	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%
	24	80.0	6	86.7	26	86.7	4	13.3	13	43.3	17	56.7	1	3.3	29	96.7
Ya	59	84.3	11	15.7	45	64.3	225	35.7	31	44.3	39	55.7	0	0	70	100
P.value	P 0.816				P 0.043				P1.000				P0.300			

4. DISCUSSION

4. 1. Gender Relations with cholesterol, Triglycerides, LDL values

From the results of research by civil servants and military personnel with a sample of 100 people in which the frequency of male sex was 53 and 47 were female. The results of the chi square statistical test analysis of the sample of male gender with LDL levels > 100 mg / ml that is 24 people (45.3%), in women LDL levels > 100 mg / ml is 32 people (60.1%). Chi square statistical test results on the significance value of 95% ($\alpha = 0.05$) obtained by p-value 0.037 or $p < (\alpha = 0.05)$ OR = 2.578 95% CI (1.138 - 5.840) this means that the sex has a significant effect on LDL. The result of OR = 2.578 95% CI (1.138 - 5.840) which was interpreted that the female respondents had higher LDL levels 2.578 times than the male respondents. The results of the research obtained were not in line with previous studies, where previous studies suggested that there was no significant relationship of sex with LDL levels. (Sri Ujjani, 2015)

4.2. Relationship to exercise ≥ 60 minutes a day with cholesterol, triglyceride, LDL, HDL

From the results of PNS and military personnel research with a sample of 100 people where the frequency of respondents did not exercise ≥ 60 minutes a day as many as 67 people and respondents who exercised ≥ 60 minutes a day as many as 33 people. The results of chi square statistical test analysis of samples on respondents did not exercise every day HDL levels (> 60 mg / ml) which is 66 people (98%), in the respondents who exercise every day HDL levels (> 60 mg / ml) were 33 people (100%), the results of the chi square statistical test at 95% significance value ($\alpha =$

0.05) obtained by p-value 0.039 or $p > (\alpha = 0.05)$ the value of OR = 3.974 95% CI (1.526, 1.025) with Lower value <1, this means that exercise every day has a significant effect on HDL. In the results of the research obtained are not in line with previous studies, where previous research suggested that there was a meaningful relationship to exercise ≥ 60 minutes a day with LDL levels (Rodwell V)

4. 3. Smoking relationship > 10 years with cholesterol, triglyceride, LDL, HDL.

From the results of the study with a sample of 100 people in Smoking Respondents more than 10 years LDL levels > 100 mg / ml that is 10 people (38.5%). Chi square statistical test results on the significance value of 95% ($\alpha = 0.05$) obtained by p-value 0.048 or $p < (\alpha = 0.05)$ OR = 0.380 95% CI (0.154, 0.954) with a value of <1, this means that smoking for more than 10 years has a significant effect on LDL. In this study in line with Craig's study showed a significant association between LDL levels with smoking, but craig research was not in line with cholesterol, triglycerides and HDL levels, which Craig's study revealed a correlation between elevated cholesterol, triglycerides and HD.

4. 4. Feeding fried foods <3 times a week with cholesterol, triglyceride, LDL, HDL

From the results of PNS and military personnel research with a sample of 100 people where the frequency of respondents did not eat fried <3 times a week as many as 65 people and respondents ate fried <3 times a week as many as 35 people. The results of chi square statistical test analysis of samples on respondents eating fried <3 times a week levels of triglycerides > 200 mg / ml that is 4 people (13.3%), on respondents eating fried <3 times a week levels of triglycerides > 200 mg / ml is 25

people (35.7 %), The results of the chi square statistical test at 95% significance value ($\alpha = 0.05$) obtained by p-value 0.043 or $p > (\alpha = 0.05)$ OR value = 2.277; 95% CI (0.087, 0.884) with a value of <1 , this means that eating fried foods <3 times a week has a significant effect on triglycerides.

5. CONCLUSIONS

- Gender Relationship with LDL Levels, Has Meaningful Value p-value 0.037
- Relationships Exercise every day with Triglycerides Have Meaningful Value p-value 0.03
- The relationship of smoking > 10 years with the value of LDL has a meaningful value p-value 0.048
- Feeding fried foods <3 times a week with triglyceride values, Has a meaningful value of p-value 0.043

6. RECOMMENDATIONS

- For the navy's Health Service to make a quarterly cholesterol level, triglyceride, LDL, HDL examination program (3 months) which is an important part of the program in improving and monitoring the health of personnel in their respective work units. Where the program is made is the result of the agreement of the officials so that it is carried out with a joint commitment.
- For officers clinic officials make / carry out counseling about Factor (food patterns, Physical activity, smoking), Cause (arteriosclerosis, Coronary Heart) prevention (Exercise, keep eating) high cholesterol in the blood. In personnel who have cholesterol, triglyceride, LDL, HDL levels are physically invisible and cannot be felt by themselves but can cause high risk (coronary heart disease) to cause death
- For the next researcher. Further research is still needed to complete the results of this study.

REFERENCES

- Adiwinanto, Wahyu, 2013. *Pengaruh intervensi olahraga di sekolah terhadap indeks*

masa tubuhdanting katkesegarankardio respirasipadaremaobesitas.

- Arnesen E, 1990. *Coffe and Serum Cholesterol*, Jakarta: BMJ.
- Almatsier Sunita, 2014. *Prinsip Dasar Ilmu Gizi untuk Kesehatan*, Jakarta, Raja Grafindo Persada,
- Almatsier, S, 2006. *Prinsip Dasar Ilmu Gizi*, Gramedia, Jakarta.
- Basha, A., 2012. *Obesitas pada hipertensi regulasi sistem kardiovaskuler. Jurnalkardiologi Indonesia.*
- Baron, Robert B, 2011. "Lipid Disorder", di dalam Stephen J. McPhee dkk (Ed), *Current Medical Diagnosis & Treatment*, McGraw-Hill, USA, 1637 halaman.
- Caroline R, Fátima M De, 2016 Physical Activity and Lipid Profile in the ELSA-Brasil Study. *Sociadade Bras Cardiol.*
- Craig WY, 1989. Cigarette smoking and serum lipid and lipoprotein concentrations: an analysis of published data. *British Medical Journal*. Tan hoantyay, apt & DRS. Kiranarahardja, apt, 1978 *obat- obat pending*, edisike 5 , Pt. Elex Media Komputindo.
- Deviana. 2010. *Solusitepat mengelola kolesterol*. Yogyakarta: Cemerlang
- Desti Nuraeni, 2012 *Hubungan kebiasaan konsumsi lemak jenuh dan obesitas sentral dengan kolesterol total pada dosen dan karyawan universitas siliwangi sikmalaya.*
- Freeman Mason, Junge Christine, 2008. *Kolesterol Rendah Jantung Sehat*, Penerbit Buanallmu Populer.
- Faisal Baraas, 1993. *Upaya Menuju Jantung Sehat Tentang Kolesterol*, Jakarta: Data Jantung Indonesia.
- Faisal Baraas, 1985. *Penyakit Jantung Koroner, Gangguan pada Aspek Hemodinamik*, Jakarta: Medika.
- Garrison RJ, Kannel WB, Feinleib M, Castelli WP, et al. Cigarette smoking and HDL cholesterol the Framingham offspring study.
- Guyton CA, 2007. *Buku Ajar Fisiologi Kedokteran (Edisi Kesebelas)*. Departement of Physiology and Bio-physics University of Missisipi Medical Center. Jakarta: EGC.
- Haffner, S, Taegtmeier, H., 2003. *Epidemic Obesity And the Metabolic Syndrome. Circulation.*
- J Clin Endocrinol Metab. 2012. *Gidelines for management of dyslipidemia and prevention*

- of atherosclerosis. AACE Lipid And Atherosclerosis Guidelines, EndocrPract.
- Klop B, Elte JWF, 2013. Dyslipidemia in Obesity: Mechanism and Potential Targets. Nutrients.
 - Kwiterovich PO. 2008. Recognition and Management of Dyslipidemia in Children and Adolescents.
 - Kwiterovich PO. 2008. *Recognition and Management of Dyslipidemia in Children and Adolescents*. J ClinEndocrinolMetab.
 - Miranti, Yeni, 2008. *Hubungan persentase lemak tubuh, indeks massa tubuh, asupan lemak dan serat dengan kadar kolesterol darah* (studipadawanitadewasa di perumahan madu asri kabupaten Karanganyar). Under-graduate thesis Diponegoro University.
 - Murray, Robert K; et all, 2003. *Biokimia Harper*, diterjemahkan oleh Brahm U. Pendit, EGC, Jakarta.
 - Marice Sihombing, 2015. Faktor Risiko Sindrom Metabolik Pada Orang Dewasa Di Kota Bogor (*Risk Factors Metabolic Syndrome Amongin Bogor*)
 - Moraleda BR, 2013. Can the exercise mode determine lipid profile improvements in obese patients? Nutr Hosp.
 - Martiem Mawi, 2003. Indeks massa tubuh se bagai determinan penyakit jantung koroner pada orang dewasa berusia di atas 35 tahun.
 - Nugraha, Aziz., Widyatmoko, Sigit., 2014. Hubungan Indeks Massa Tubuh dengan Kadar Kolesterol Total pada Guru dan Karyawan SMA MUHAMMADIYAH 1 dan 2 Surakarta: Fakultas Kedokteran Universitas Muhammadiyah Surakarta.
 - Nurmalina, R, 2011, *Pencegahan Dan Manajemen Obesitas Panduan Untuk Keluarga*, IKAPI Jakarta.
 - Odelia V. 2011. Cara Cerdas melibas Kolesterol. Semarang: Ega Acitya,;
 - Pilch WB, 2015. The influence of a 12-week program of physical activity on changes in body composition and lipid and carbohydrate status in postmenopausal women.
 - Pooranfar S, Shakoor E, 2014. The Effect of Exercise Training on Quality and Quantity of Sleep and Lipid Profile in Renal Transplant Patients: A Randomized Clinical Trial. Int J Organ Transplant Med.
 - Rodwell V, 2015. Bender D, Botham K, Kennelly P, Weil A. Harper's Illustrated Biochemistry. 30th ed. Mc Graw Hill Education.
 - Riele, 2014. *Teach mode via touchscreen, teach-in mode via touchsereen*, Pt. Rajawali.
 - Rodwell V, Bender D, 2015. Harper's Illustrated Biochemistry. 30th ed. Mc Graw Hill Education; Whitney E, Rolfes SR. Understanding Nutrition. 14th ed. Cengage Learning; 2015. hlm.142 – 14
 - Supriyono M, 2008. *Faktor-faktor risiko yang berpengaruh terhadap kejadian penyakit jantung koroner pada kelompok usia < 45 tahun*.
 - Sitepoe Mangku, 1992. *Kolesterol Fobia Keterkaitannya Dengan Penyakit Jantung*, Jakarta: Gramedia Pustaka Utama.
 - Sukeksidan Anggraini. 2009. *Kadar Kolesterol Darah pada Penderita Obesitas di Kelurahan Kopri Sambiroto Semarang*. Jurnal Kesehatan.
 - Sulviana N. 2011. Analisis hubungan gaya hidup dan pola makan dengan kadar lipid darah dan tekanan darah pada penderita jantung koroner. Laporan terakhir. Bogor: Fakultas Pertanian Institut Pertanian Bogor.
 - Shabela Rifdah, 2012. *Pahami Waspada! Cegah dan Musnahkan Kolesterol*. Klaten. Cable Book.
 - Suparjo HP. 2010. Hubungan Rasio Lingkar Pinggang dengan Profil Lipid pada Pasien PJK di Poliklinik Jantung RSUD dr. Moewardi Surakarta.
 - Sri Ujiani, 2015. Hubungan Antara Usia Dan Jenis Kelamin Dengan Kadar Kolesterol Penderita Obesitas.
 - Siti Nurul Hidayati, 2006. Hubungan Asupan Zat Gizi dan Indeks Masa Tubuh Hubungan Asupan Zat Gizi dan Indeks Masa Tubuh dengan Hiperlipidemia pada Murid SLTP yang dengan Hiperlipidemia pada Murid SLTP yang Obesitas di Yogyakarta.
 - Tabuchi M, 2012. Kitayama J, Nagawa H. Hyperglycemia and Hypertriglyceridemia may Associate with The Adenoma-Carcinoma Transition in Colorectal Epithelial Cells.
 - Waloya T, 2013. Hubungan antara konsumsi pangan dan aktivitas fisik dengan kadar kolesterol darah pria dan wanita dewasa di Bogor. J Gizidan Pangan.
 - Whitney E, Rolfes SR, 2015. Understanding Nutrition. 14th ed. Cengage Learning.

- Zakiyah D, 2012. Faktorresiko Penyakit Jantung Koroner. LaporanTerakhir. Jakarta: FakultasKesehatanMasyarakatUniversitas Indonesia.

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