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Effect of Total Cholesterol Levels and Triglycerides on Blood Pressure Hypertension Patients Overview against Puskesmas Banjar Ethnic Group in Cempaka Banjarmasin

Huldani[1*], Siti Kaidah[1], Dwi Laksono Adiputro[2], Harun Achmad[3], Bayu Indra Sukmana[4], Deby Kania Tri Putri[5], Yusrinie Wasiaturrahmah[5], Renie Kumala Dewi[6], Didit Aspriyanto[7], Isnur Hatta[8], Saka Winias[9], Ariyati Retno Pratiwi[10], Ernita sari[11], Aminuddin Prahatama Putra[12], Anastasya Deborah M. C Manik[13], Ketrin Zailin[13], Ika Kusuma Wardani[14]

[*1]Department of Physiology, Faculty of Medicine, Lambung Mangkurat University, Banjarmasin, Indonesia
[2]Department of Cardiology, Faculty of Medicine, Lambung Mangkurat University, Banjarmasin, Indonesia
[3]Department of Pediatric Dentistry, Faculty of Dentistry, Hasanuddin University, Makassar, South Sulawesi, Indonesia
[4]Department of Dental Radiology, Faculty of Dentistry, Lambung Mangkurat University, Banjarmasin, Indonesia
[5]Department of Biomedic, Faculty of Dentistry, Lambung Mangkurat University, Banjarmasin, Indonesia
[6]Department of Pediatric Dentistry, Faculty of Dentistry, Lambung Mangkurat University, Banjarmasin, Indonesia
[7]Department of Oral & Maxillofacial Radiology, Faculty of Dentistry, Lambung Mangkurat University, Banjarmasin, Indonesia
[8]Department of Preventive and Public Health Dentistry, Faculty of Dentistry, Lambung Mangkurat University, Banjarmasin, Indonesia
[9]Department of Oral Medicine, Faculty of Dental Medicine, Airlangga University, Surabaya, Indonesia
[10]Department of Oral Biology Faculty of Dentistry, Brawijaya University, Malang, Indonesia
[11]Department of Oral Biology, Faculty of Dentistry, Institute of Health Sciences Bhakti Wiyata, Kediri, Indonesia
[12]Biology Education Department, Faculty of Teacher Training and Education, Lambung Mangkurat University, Banjarmasin, Indonesia
[13]Co-Assistant Doctor, Faculty of Medicine, Lambung Mangkurat University, Banjarmasin, Indonesia
[14] Department of Public Health Dentistry, Faculty of Dentistry, Lambung Mangkurat University, Banjarmasin, Indonesia
Corresponding Author: E-mail: huldani@gmail.com

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ABSTRACT

The Banjar tribe has a pattern of consumption of foods that tend range to be high in fat and carbohydrates but low fiber, that can be one of the risk factors for hypercholesterolemia leads to atherosclerosis. Atherosclerosis cause constrict, harden, and stiffen, thereby causing an Increase in blood pressure. The purpose of this study was to Determine the effect of total cholesterol and triglyceride levels on blood pressure in hypertension tribal Banjar Patients at the Cempaka Health Center Banjarmasin. This method of this research is observational analytic with cross sectional design. The population was all Banjar tribal Hypertension Patients at the Cempaka Banjarmasin Public Health Center with a purposive sampling method. Samples of this study were 60 Hypertension Patients (30 with normal cholesterol and triglyceride levels and hypertension 30 Patients with high cholesterol and triglyceride levels). Total cholesterol and trigliserd levels of intravenous blood was measured using a spectrophotometer. Blood pressure was measured using a sphygmomanometer and a stethoscope. The results analysis using the Mann-Whitney test get between the normal blood pressure and high cholesterol groups were Obtained p value = 0389 for systolic and p = 0179 for diastolic. There was no significant difference of systolic and diastolic blood pressure between the normal cholesterol group and the high-cholesterol group while triglyceride, we Blood pressure was measured using a sphygmomanometer and a stethoscope. The results analysis using the Mann-Whitney test get between the normal blood pressure and high cholesterol groups were Obtained p value = 0389 for systolic and p = 0179 for diastolic. There was no significant difference of systolic and diastolic blood pressure between the normal cholesterol group and the high-cholesterol group while triglyceride, we Blood pressure was measured using a sphygmomanometer and a stethoscope. The results analysis using the Mann-Whitney test get between the normal blood pressure and high cholesterol groups were Obtained p value = 0389 for systolic and p = 0179 for diastolic. There was no significant difference of systolic and diastolic blood pressure between the normal cholesterol group and the high-cholesterol group while triglyceride, wefound that there was significant effect was Obtained between the triglycerides levels on blood pressure with p = 0.011 (P <0.05).

Keywords: Total cholesterol levels, Triglycerides, Blood pressure, Hypertension patients, Banjar tribe.

Correspondence:
Huldani
Department of Physiology, Faculty of Medicine, Lambung Mangkurat University, Banjarmasin, Indonsia
E-mail: huldani@gmail.com

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PRELIMINARY

Hypertension is a disease that is not contagious and one of the causes of death were quite high in Indonesia. Hypertension in the initial phase is rarely diagnosed because they do not cause symptoms, so people do not know before checking the blood pressure.[1] In 2007, the prevalence of hypertension in Indonesia amounted to 31.7%. Largest contributor to the deaths of nearly 9.4 million deaths annualy. One of largest contributor to the province of South Kalmantan hypertension is approximately 44.1% of pastients with hypertension in London there are 17,556.[1,2] In 2017, the City Health Office reported there were a total of 76.548 Banjarmasin patient soul hipertensi.[2,3] Patient with hypertension based on data taken as much as 26.5% of villagers Gadang suffer from hypertension.[2]

Some components are associated with blood pressure, namely total cholesterol, HDL, LDL, and trigliserida.[4,5] Cholesterol is a fatty substance such as wax component that beradar in blood and yellowish in color and is needed by tubuh.[6] Triglycerides are lipids comprising glycerol and fatty acid that serves as a source of energy and is a major lipid storage in adipose tissue. The good triglyceride levels less than 150 mg / dl. Triglycerides are a constituent of LDL,

VLDL and HDL so that when increased levels of these components in the blood will increase the levels of triglycerides in the blood. Increased levels of triglycerides in the blood causes the blood viscosity so increased that lead to disruption of blood flow The blood vessels so the heart work harder to pump blood and an increase the blood pressure.[7] Hiperkolestrolemia also can lead to the buildup of cholesterol in the arterial lumen or referred to as atherosclerosis and causes the artery narrowing, hardening, and stiffness, this is what causes the elevated peripheral vascular resistance and increase the pressure darah.[8] There are several factors that may influence the occurrence of hypertension, either of the factors that could amended as smoking, obesity, physical activity and diet and factors that can not be changed such as age, gender and genetics, diet.[9] Banjar tribal societies tend to be high in fat, high in carbohydrates and low in fiber that can trigger high blood pressure risk factors.[10] Examples of typical food banjo which tend to be high in fat, high in carbohydrates and low in fiber such as yellow rice, soto Banjar, rhombus Kandangan, pundut rice, rice cake, salted fish, catfish, offal, fish papuyu or etching, anchovies, duck, salted egg and wide -macam Banjar types of cakes that use rice and rice flour or flour ketan.[11] regard to race, based on the results of research conducted by Rina et al, explains that one of the genes that enos3 allegedly associated with hypertension identified several polymorphisms of genes enos3, one of which is Glu298Asp that normally occur in Minang tribe, where tribal and ethnic Minang Banjar comes from the same tribe that is Melayu.[12]

RESEARCH METHODS

This study was an observational analysis with cross sectional approach. These samples included 60 patients with hypertension Banjarese. Subjects selected purposively sampling that meet the criteria namely inclusion Banjarese hypertensive patients, aged between 35-60 years, the patients who come to the health center at least twice Cempaka Banjarmasin and hypertensive patients undiagnosed comorbidities such as diabetes mellitus, heart failure, and chronic renal failure. Study exclusion criteria were patients did not come for blood sampling, patients with contraindications to do blood sampling, women who are pregnant and menopause. The study was conducted in October-November 2019.

The independent variables were blood triglyceride levels, blood pressure as the dependent variable, and as a confounding variable is genetics, medicine and food consumed.

Data were analyzed using SPSS. Test for normality using Kolmogorov Smornov to determine the distribution of the data. To analyze the effect of total cholesterol and triglyceride levels on blood pressure Mann Whitney test was used. Test of significance is determined based on the value of $p < 0.05$.

RESULTS AND DISCUSSION

Based on the results of research conducted on 60 subjects with hypertension patients in Puskesmas Banjar tribe Cempaka Banjarmasin data obtained as presented in figure and table

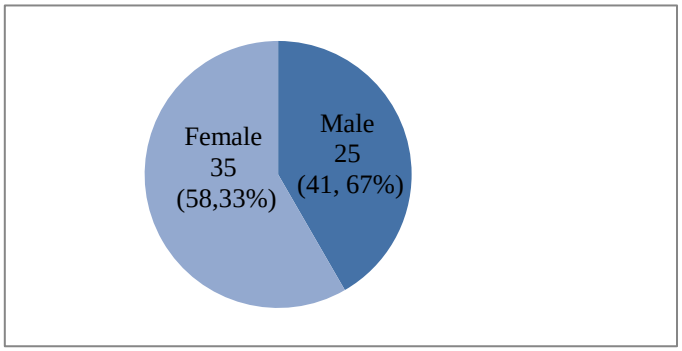


Figure 1: Characteristics subject by gender

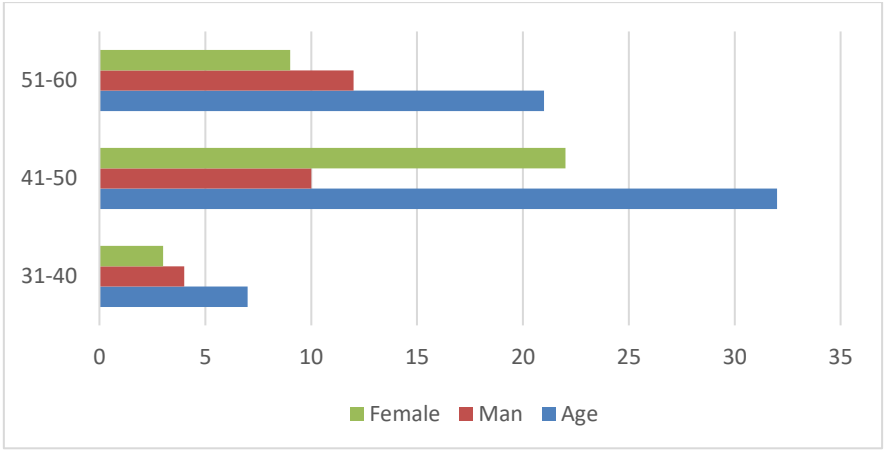


Figure 2: Characteristics of subjects by age and gender

Table 1: Characteristics of research subjects

Characteristics	n = 60	(%)
Blood pressure		
nonnotensive	7	11.66
Hypertension	53	88.33
Antihypertensive		
amlodipine	38	63.33
captopril	22	36.67
Levels of total cholesterol and triglycerides		
Normal		
Abnormal	30	50
	30	50

Information: % = Percentage; n = number of research subjects

Table 2: Average blood pressure on Normal and High Cholesterol

BP / Cholesterol	Normal		Hypertension	
	Systolic	Diastolic	systolic	Diastolic
Normal (<200 mg / dl)	124	84	160	108
Not Normal (>200 mg / dl)	127	85	152	103

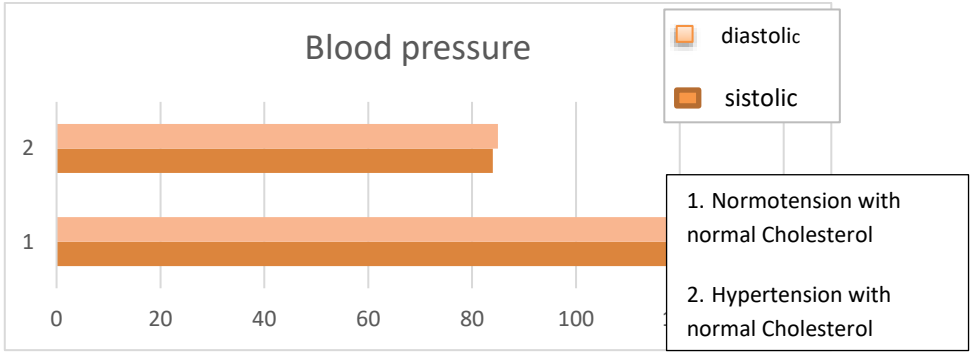


Figure 3: Average Blood pressure on normotension and hypertension with normal cholesterol

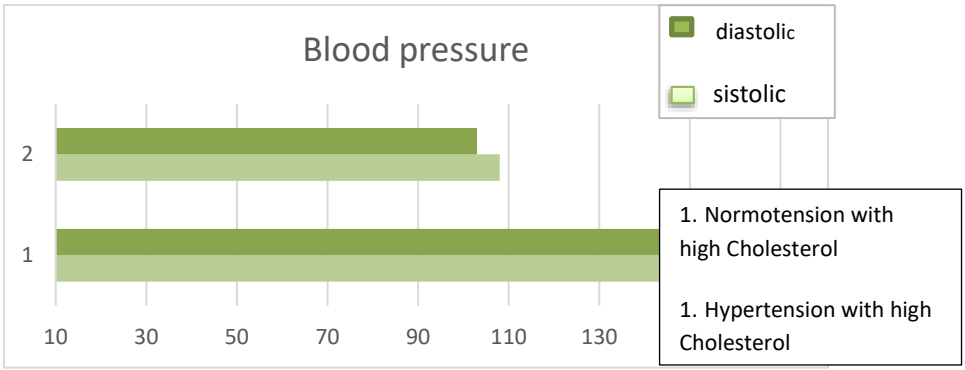


Figure 4: Average Blood pressure on normotension and hypertension with high cholesterol

Table 3: Average blood pressure on Normal and High trigliceride

BP / Triglycerides	Normal		Hypertension	
	Systolic	Diastolic	systolic	Diastolic

Normal (<150 mg / dl)	125	80	143	92
Not Normal (> 150 mg / dl)	130	80	151	94

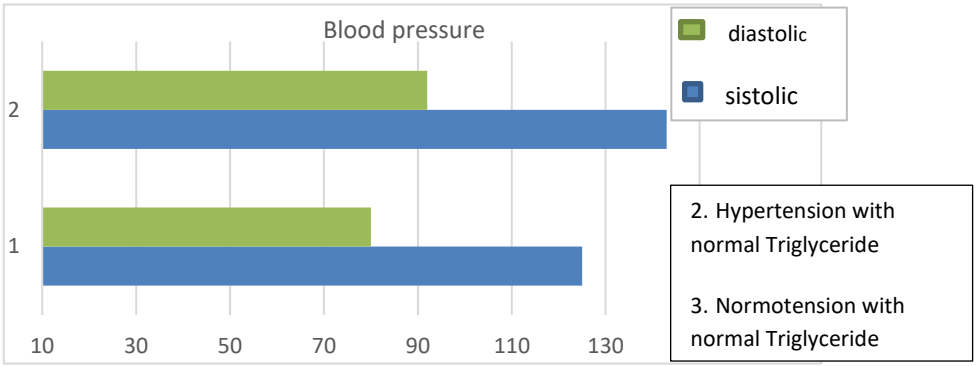
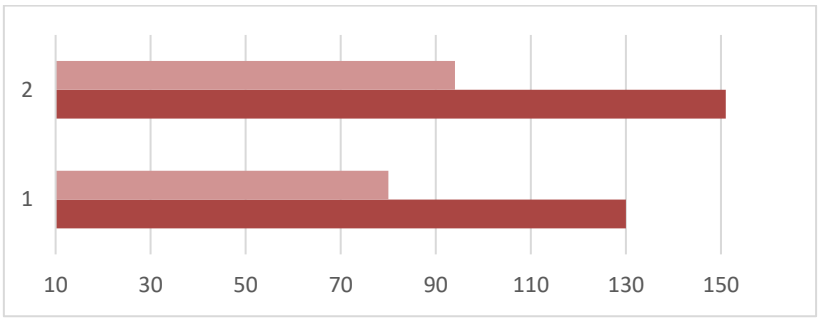


Figure 5: Average Blood pressure on normotension and hypertension with normal triglyceride



diastolic
Sistolic
1. Hypertension with high Triglyceride
2. Normotension with high triglyceride

Figure 6: Average Blood pressure on normotension and hypertension with normal triglyceride

Data were categorized into blood pressure group normal cholesterol and high as shown in Table 2, then searched the mean blood pressure, obtained systolic blood pressure and diastolic group normal cholesterol of 143 mmHg and 87 mmHg and systolic blood pressure and diastolic group of high cholesterol of 145 mmHg and 90 mmHg in other words, blood pressure high cholesterol group had slightly higher blood pressure than normal blood pressure cholesterol group.

Based on Table 3 obtained average normal blood pressure at normal triglyceride levels in a sequence of 125 mmHg systolic and 80 mmHg diastolic. The mean blood pressure of hypertension in normal triglyceride levels in a sequence of 143 mmHg systolic and 92 mmHg diastolic. The mean normal blood pressure at normal levels of triglycerides are not sequentially at 130 mmHg systolic and 80 mmHg diastolic. Mean blood pressure hypertension abnormal triglyceride levels in a sequence of 151 mmHg systolic and 94 mmHg diastolic.

Effect of Total Cholesterol Levels Of Blood Pressure

The results of the analysis Mann Whitney normal blood pressure and high cholesterol groups obtained by value p = 0.389 for sistolnya and p = 0.179 for diastolnya, which means there is no significant difference between systolic and diastolic blood pressure normal and high cholesterol group in this study. The results are consistent with research conducted by Lingga, where the results obtained, not all hypercholesterolemic patients also develop hypertension and vice versa, cholesterol levels tend to be high will lead to increased blood pressure, where people are very at risk of having high cholesterol levels is with diet that contain high saturated fats eg butter, cheese, fish and cream can increase levels of LDL cholesterol in darah.[13]

Research Naue et al got the same results, it was found that the correlation coefficient (r) between the total cholesterol with diastolic blood pressure of -0.090, while the coefficient of determination (r2) of 0.008, so the result is there is no relationship between cholesterol and blood pressure in junior high school teacher 1 & 2 Haezar Manado and senior Eben Eben Haezar Manado.[14]

Unlike the Karnisius research, where there is a relationship between cholesterol levels in blood pressure with the strength of a strong relationship (p = 0.003, r = 0.621) .[13] Research Maryati also mendapaat the same result, which sig. (2-tailed) was 0,000, that there is a significant correlation between cholesterol levels with high levels of hypertension with a correlation coefficient 0,668.[15] Number of samples in both these studies examined only on 21 samples and 34 samples by means of data capture in total cholesterol levels

with gauges cholesterol digital, so the results can berbeda.[8,15] Data blood pressure in hypertensive patients in the study Maryati show all patients categorized as high both systole and diastol.[15] While in this study, not all blood pressure patients obtain high yields.

The thickening of the arterial wall can be caused due to the high accumulation of cholesterol in the blood by the formation of fibrous tissue, calcification and are associated with changes in the tunica intiima artery walls. The formation of arteriosclerosis takes lama.[16] studies in mice to mention, after a six-month treatment of high cholesterol feed, just the change of artery structure and characterized by the formation of plaque in the lumen arteri.[15] This indicates that endothelial dysfunction have occurred in the beginning of the development of arteriosclerosis create increased blood pressure,[16] thus takes hypercholesterolemia in quite a long time to bring about changes in the arterial endothelium resulting in increased blood pressure.

Based on the results of data analysis and hypothesis testing in this study, it is known that the hypotheses made are not proven to be empirically valid. Total blood cholesterol level does not affect blood pressure in hypertensive patients of the Banjar tribe at the Cempaka Banjarmasin Public Health Center, this may be caused by confounding variables such as genetic, food, antihypertensive drugs and hypercholesterolemia drugs consumed by the patient.

Against Triglyceride Levels Influence Blood Pressure

Mann Whitney test results obtained significance value of 0.011 (p <0.05), it can be concluded that there is influence triglyceride levels on blood pressure in hypertensive patients in Puskesmas Banjar Tribe Cempaka Banjarmasin.

This study is in line with research Feryadi, et al in 2014 in Padang states that there is a significant result in the amount of p = 0.04 or p <0.05. Wherein the abnormal triglyceride levels are a risk factor for hypertension of 2.49 times than that having high levels of triglycerides normal.[17] Other studies conducted by Setyawati VAV, et al stated that there are a significant p results between blood triglyceride with systolic blood pressure by p = 0.017 and diastolic blood pressure at p = 0.027. In this study stated that the triglyceride has a close relationship to blood pressure because the triglyceride is one of the blood lipoprotein and is also a constituent component of HDL cholesterol, VLDL, LDL, so if the increased levels of these components in the blood it will have an impact on the increase in blood triglyceride levels. Triglycerides also affect blood viscosity, the higher the blood triglyceride levels in blood viscosity will also be higher. It causes the blood becomes difficult to flow resulting in heart work harder to pump blood and causes blood pressure to rise. Where there are several factors associated with blood pressure as low activity level and lifestyle including eating habits, such as high-fat foods tend to have a pretty bad lipid profile. Lipid profile such as total cholesterol, HDL and LDL influence on blood pressure. Then, fasting time for 10 to 12 hours before taking blood also contributes to triglyceride levels, when fasting VLDL contains a lot of triglycerides according to the subjects taken can reduce obesity it will increase hypertriglyceridemia.[17,18]

Another study also carried out by An Fenghui, et al in China in 2019 was conducted in two groups, namely the essential hypertension group and a multi-ethnic based control group in China with triglyceride levels, a significant finding of p = 0.004 or p <0, 05 Significant results were obtained compiled by ethnicity, the relationship between polymorphism rs2858060 and the risk of essential hypertension in the Han ethnic group in China of p = 0.049 or p <0.05. Because this is one of the many multi-ethnic countries that have many tribes, each of them has different cultural traditions in the social and environmental environment and patterns of daily life that can contribute to the effects of hypertension.[19]

In this study, the average triglyceride level of the patient was above the normal triglyceride level and the mean blood pressure of the patient was high blood pressure. There are factors that can cause an increase in triglyceride levels in a person, namely, obesity, lack of physical activity, a high-carbohydrate diet, smoking, alcohol consumption, chronic disease content, drugs, and genetic factors. Factors that can be used are alcohol consumption, smoking, the influence of disease and the use of drugs. But there are some factors which cannot be changed, such as food consumption and genetic factors.[19,20,21]

One of the most influential factors in increasing triglyceride levels is foods that are high in fat, high in fat, high in cholesterol which are the source of triglycerides, and increase triglyceride levels in the blood, which increases also related to blood and increases it.

Limitations in this study include a variety of factors that still cannot be limited, such as food, daily physical activity, genetic factors, drugs that require less research time.

CLOSING

Based on the results of research and discussion can be concluded thatthere was no significant difference in blood pressure in hypertensive patients tribal hamlets with normal cholesterol levels and high value for systole p = 0.389 and p = 0.175 for diastolic and there is no influence total cholesterol on blood pressure in patients hipetensi Banjar ethnic group. howeverthere is the effect of triglyceride levels on blood pressure in hypertensive patients at the health center Banjarese Cempaka Banjarmasin with p = 0.011.

REFERENCES

1. AN Sholehah. (2016). Relations antihypertensive medication adherence to blood pressure in hypertensive patients Salamrejo Village. [Thesis]. Yogyakarta. Universitas Muhammadiyah Yogyakarta. Faculty of Medicine and Health Sciences.
2. Adiputro DL, Asnawati, Huldani, Achmad H, Arwandy D, Teghar YP, Rizal FA. (2020). Hypertension with left atrium abnormalities, left ventricular hypertrophy, Qt interval and smoker. Indian Journal of Public Health Research and Development. 11(3). 1531-1635.
3. Banjarmasin City Health Department. (2017). The annual report moridity data Banjarmasin: (2Triglycerides as a prognostic factor for uncontrolled hypertension in postmenopausal women in the city of Bogor 2014 Bogor. Health Research Bulletin.

4. Maryati, H. (2017). Relations cholesterol levels with blood pressure of hypertensive patients in the hamlet of subdistricts Ploso Rejoagung village Sidomulyo Jombang district. [Thesis]. Jombang: STIKES Jombang regency.
5. Ulfah M., Sukandar H, Afiatin. (2017). Relationships total cholesterol levels with blood pressure in people Jatinangor.Sumedang. Padjadjaran University. Medical School.
6. Kartini Sham. (2012). Relations food consumption patterns with the incidence of type 2 diabetes mellitus in the population of women in the city of Banjarmasin. [Thesis]. Yogyakarta. Gadjah Mada University. Public Health Sciences.
7. Nurhamidi, Netty, Fathurrahman. (2014). Study unit conversions household size in the weight (grams) in some types of traditional foods processed Banjar community in Singapore. Journal of Health Scale.
8. Kartini S. (2012). Relations food consumption patterns with the incidence of type 2 diabetes mellitus in the population of women in the city of Banjarmasin. [Thesis]. Yogyakarta. Gadjah Mada University. Public Health Sciences.
9. Rina, Setiawan Siregar CT. (2016). Minang tribe experience hypertensive patients undergoing treatment at home. North Sumatra. University of Northern Sumatra. Nursing faculty. Nurses Nursing Journal. Vol.12 No.1.
10. Sutanto. (2010). Block (cease and desist) modern diseases as hypertension, stroke, heart disease, cholesterol, and diabetes. Yogyakarta: ANDI.
11. William HJ. Johnson L, Carson KGS, Jackson CL. (2002). Characteristics of intact and ruptured atherosklerosic brachiocephalic of plaques in the arteries of the apolipoprotein E knouckout mice. United Kingdom: ATBV Journal. 22 (5): 788-92
12. Harefa K, Manurung K, and Irawati J. (2009). Relations cholesterol levels with blood pressure in hypertensive patients in the internal medicine Swadana Khajuraho Hospital in 2009 [EI]. Terrain: University Sari Mutiara.
13. Setyawati VAV, et al. (2011). Factors associated with blood pressure on civil servants SMAN 8 Semarang. Semarang. Journal Visikes. Vol.10 No.2.
14. Feryadi R, et al. (2015). Relationships levels of lipid profile with hypertension in ethnic communities
15. An Fenghui, et al. (2019). Associations between single nucleotide polymorphisms in miR-221, self-reported essential hypertension, and interactions between genetic and environmental factors: a multiethnic study in China. China. Am J transl.
16. Huldani, Achmad H, Arsyad A,Putra AP, Sukmana BI, Adiputro DL, Kasab J. (2020). Differences in VO2 Max Based on Age, Gender, Hemoglobin Levels, and Leukocyte Counts in Hajj Prospective Pilgrims in Hulu Sungai Tengah Regency, South Kalimantan. Sys Rev Pharm 11(4): 09 14.
17. Huldani, Pattelongi I, Missi MN, Idris I, Bukhari A, Widodo ADW, Achmad H. (2020). Research Reviews on Effect of Exercise on DAMP's, HMGB1, Proinflammatory Cytokines and Leukocytes. Sys Rev Pharm. 11(4): 306-312.
18. Achmad H, Thahir H, Rieuwpassa I, Mardiana AA, Oktawati S, Samad R, Djais AI, Gani A, Singgih MF, Madjid F, Admy SC. (2020). The Effectiveness of Channa sriata Extract Antimicrobial Effect on Periopathogen Bacteria (Porphyromonas gingivalis and Aggregatibacter actinomycetescomitans). Sys Rev Pharm. 11(4): 319-323.