

# RISK FACTOR AND PREVALENCE OF HYPERTENSION IN THE EMPLOYEE OF CRACKERS FACTORY AT RANCAILAT VILLAGE, KRESEK COUNTY, BANTEN PROVINCE

Dian Mardhiyah\*, Eriyasih, Nurjanah A, Pramita N, Rozalina Zakaria

<sup>1</sup>Public Health Department Faculty of Medicine, YARSI University Indonesia

\*Corresponding Author's Email: dian\_mardhiyah@yahoo.co.id

## ABSTRACT

**Introduction:** Hypertension is one of the society health problems occurs in developing country as well as in the developed one. Hypertension is a disease which the systolic blood pressure reaches  $\geq 140$  mmHg and/or  $\geq 90$  mmHg for the diastolic. According to the reports of Kresek Primary Healthcare Center on health service in 2017, hypertension is the second highest disease occurs in Kresek County. **Method:** This study has a purpose to find out correlation between hypertension risk factors and hypertension incidence on The Haji Oman Traditional Crackers Factory. The population in this study was 30 labors from Haji Oman Traditional Crackers Factory. The result showed that there was correlation between smoking as the risk factor of hypertension, and hypertension incidence ( $p < 0.035$ ). Although the other risk factors did not show any significant correlation. The population with hypertension were 73.3% (22 people), prehypertension 10.0% (3 people), and normal blood pressure were 26.7% (5 people).

**Keywords:** Hypertension Risk Factors, Hypertension, Labor

## INTRODUCTION

Health is precious investment to create high quality human source. Health Regulation protects every citizen from high risk noncontagious disease such as hypertension, stroke, diabetes and heart disease which mainly caused by high intake on sodium, calories and fat (Kemenkes, 2013).

Hypertension brings problems to all nations, developing countries nor developed ones. Hypertension is a situation of systolic blood pressure  $\geq 140$  mmHg and  $\geq 90$  mmHg for diastolic pressure. Hypertension known as "silent killer" for it shows none any symptoms. Uncontrolled hypertension causes to cardiovascular disease seven times higher, six times higher prone to Congestive Heart Failure (CHF) and three times susceptible becoming heart attack (Rahajeng & Tuminah, 2009).

Health Primary Research in 2007 and 2013 (Riskesdas) in Indonesia show tendency of inclining prevalence of hypertension, diabetes, stroke and joint disease (rheumatoid). The numbers will not stop there (Kementrian Kesehatan 2017). (Riskesdas 2013) showed hypertension prevalence among 18 years old

population is quite high (25.8%) and in Banten province is 23%. The prevalence is escalating due to age growth which can be recognized by medical diagnostic or blood pressure measurement on site. Care giver only detects hypertension 36.8% of total populations, which means 63.2% hypertension prevalence had not been detected (Mansjoer *et al.* 2015).

Primary Healthcare Center of Kresek in 2017 reported ten major diseases which were acute respiratory disease ranking at top with incidence of 9,208 patients follows with essential hypertension prevalence of 3,221 patients and pharyngitis incidence of 2,626 patients and at the bottom of the list is diarrhea with 794 patients. Which means hypertension is the second disease most reported in Primary Healthcare Center of Kresek in 2017 (Puskesmas Kresek. 2017).

Employee is every person who is working for salary or any other rewards. It has two criteria: person who is working and receiving salary and rewards (DPR RI. 2003). For any employee, Hypertension affects his job and also his productivity and whole company performance and at the end will create economical cost for the company (Hawari, 2001). Public awareness to

control blood pressure is far from ideal, especially among productive age. Most of them don't realize they already have hypertension or prehypertension (high risk to hypertension) due to hypertension shows no symptoms to most patients and lack of knowledge on disease and risk factors of hypertension (Hanum, 2014).

According to previous studies, high prevalence of hypertension is caused by two factors: uncontrolled conditions (such as heredity, sex and age) and controlled conditions (such as obesity, lack of exercise, smoking habits, and alcohol and sodium consumption). Hypertension is influenced by double risk factors which are endogen such as neurotransmitter, hormones and genetics and also exogenous factor such as smoking, nutrition and stressor (Sigarlaki, 2014; Badan Penelitian dan Pengembangan Kementerian Kesehatan RI, 2013).

Based on these facts emerge question on correlation of hypertension risk factors and hypertension prevalence to group of employees Traditional Cracker Factory in Rancailat Village, Kresek County in 2018. Several studies have been performed on prevalence of hypertension but only a few specified to analyze certain group of age such as factory employees. That is the reason why this study is performed.

## METHODOLOGY

This is quantitative study with descriptive design. Population in this study is whole employees of Traditional Cracker Factory Haji Oman located in Rancailat Village where the Primary Healthcare Center Kresek County is also located, which the villagers have low knowledge on hypertension. The sampling technique is using nonprobability technique which using total sampling.

This study is using questionnaires list of questions to gather information from respondents. The questions are multiple choices answered on risk factors hypertension. The process begins with collecting all respondents in the early morning to explain the purpose of the study and how to answer the questionnaire.

The main instrument of this study is adult size sphygmomanometer which has been calibrated and stethoscope. The measurement was performed on sitting position or lying down with supported arm as high as heart level and affected palm facing up.

Uncover the sleeve, palpate artery brachialis and place arm cuff neatly and less tight. Put the stethoscope membrane on artery brachialis, secure the pump valve. Inflate the cuff until the pressure shows 30 mmHg higher than systolic palpate pressure, unscrew the valve slowly to deflate the cuff and pressure decent average 2-3 mmHg per second. Listen carefully to the first beat (the first Korotkoff sound indicates systolic pressure), continue to deflate the cuff gradually until the abstinence of the beat (the fourth Korotkoff indicates adult diastolic pressure) and finally deflate arm cuff fast. Repeat the measurement twice with 5 minutes interval to collect the average of two measurements (Bickley, 2009). The measurement was performed in the morning before morning shift and minutes after answering the questionnaire.

The sample then compared with standard value of normal adult blood pressure (above 18 years old). Blood pressure then classified according to The Eight Joint National Committee (JNC 8) into four groups. In general hypertension is condition when the blood pressure reaches  $\geq 140/90$  mmHg. Respondent is classified of having hypertension if systolic or diastolic pressure is above standard or both systolic and diastolic reach above standard (James, Oparil, Carter, *et al.* 2014)

**Table 1: Classification of hypertension in adults (age  $\geq 18$  years)**

Blood Pressure Classification			
Classification	Systolic (mmHg)		Diastolic (mmHg)
Normal	<120	And	<80
Prehypertension	120 – 139	Or	80 – 89
Level I hypertension	140 – 159	Or	90 – 99
Level II hypertension	$\geq 160$	Or	$\geq 100$

Source: The Eighth Joint National Committee (JNC 8)  
The sample data has been processed using statistic program: Statistical Package for Social Science 23.0 version for Mac.

## RESULT

Total respondents were 30 persons, which are employed at Traditional Cracker Factory Haji Oman in Rancailat Village, Kresek County. Table 2 shows characters of two group respondent.

**Table 2: Characteristics of Respondents**

No	Characteristics	Frek	Percentage
		(f)	(%)
1	Age group		
	Young adults (18 / 20-25 years)	3	10
	Old adult age (> 25-60 / 65 years)	23	76.7
	Seniors (> 65 years)	4	13.3
	Total	30	100
2	Level of education		
	Low education (SD-SMP / MTs)	28	93.3
	Secondary education (high school / vocational school)	2	6.7
	Higher education (D3 / S1)	0	0
	Total	30	100
3	Gender		
	Male	18	60
	Female	12	40
	Total	30	100

**Demographic of Respondent**

Demographic of respondents are shown on Table 2. The population is dominated by adults – middle age adults (25 – 60/65 years old) as 76.7% of total population or 23 respondents and the smallest group is young adult age as 10% of total population or 3 respondents.

Education level is most at low grade (elementary – junior high school/Islamic elementary school) as 28 respondents or 93.3% and 2 respondents have middle school background (senior high school/ vocational high school) or 6.7%.

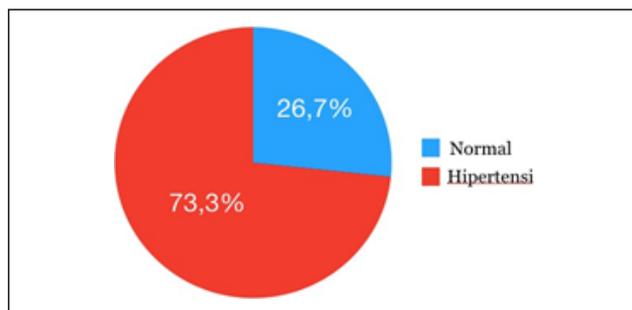
Male respondents are cover 60% of total population or consist of 18 respondents and the rest population is female respondents of 40% (12 respondents).

**Hypertension Prevalence**

Blood pressure represents the strength of blood presses against blood vessels due to cardiac pumps to the entire body tissue. Blood pressure is classified into two: systolic and diastolic pressure. Systolic pressure is strongest pump against artery when blood is pumped into artery during systole ventricle. Diastolic pressure is the lowest pressure against artery when blood is

drowning out of artery to all vessels during diastole ventricle (Sherwood, 2012).

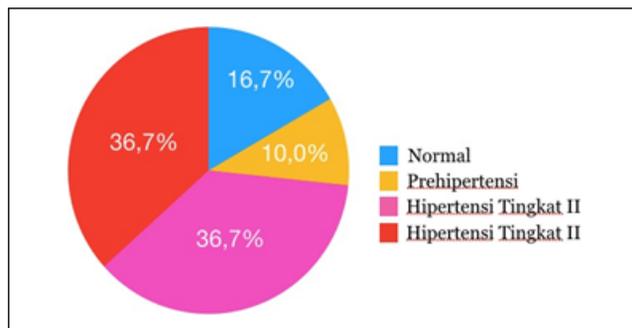
The respondents with normal blood pressure (<120 mmHg and <80 mmHg) consist of 8 respondents (26.7%). And the rest of respondents indicate hypertension as 73.3% or 22 respondents.



**Figure 1: Prevalence of hypertension in workers at Haji Oman Traditional Crackers Factory**

Based on diastolic pressure, there's 20% respondents indicates hypertension grade I and 33.3% hypertension grade II. Average systolic pressure of total population is 144.33 mmHg which means hypertension grade I dominates with percentage 33.3%. Based on diastolic pressure, 46.7% respondents indicates hypertension grade I and 20.0% indicates hypertension grade II. Average for diastolic pressure is 87.33 mmHg in the range of 70 – 120 mmHg.

Respondents are classified into hypertension if the systolic and/or diastolic pressure is exceeded normal value. Based on that definition, the data shows 74.4% prevalence hypertension which consist of hypertension grade I (36.7%) and hypertension grade II (36.7%) (Figure 1). Proportion prehypertension is quite high, 10%. It is highlighted since the risk is higher as the risk factors grow.



**Figure 2. Prevalence of hypertension based on hypertension classification**

### The Risk Factors of Hypertension

As show in Table 3, the most relevant factor to hypertension is smoking habits to respondents of 14 person (46.7%) with statistic  $p=0.035$ ;  $OR=12.25$  and  $95\%CI=1.26-118.36$ . The risk factors for hypertension are in following order: lack of exercise as 20 respondents (66.7%) with statistic  $p=1,000$ ;  $OR=0$  and  $95\%CI=0$ . Then cigarette smoke exposure as 63.6% with statistic  $p=0.466$ ;  $OR=2, 11$  and  $95\%CI=0, 28-15, 77$ . Fat consumption as 63.6% with statistic  $p=0,589$ ;  $OR=2, 11$  and  $95\%CI=0, 28-15, 77$ . Sodium consumption as 60% with statistic  $p=1,000$ ;  $OR=0, 64$  and  $95\%CI=0, 06-6.80$ . Coffee consumption as 53.3% with statistic  $p=0,104$ ;  $OR=4, 44$  and  $95\%CI=0, 80-24, 61$ . Gender for male 46.7% with statistic  $p= 0,678$ ;  $OR=0, 57$  and  $95\% CI=0, 11-2, 93$ . Nutrition status for under is 36.7% with statistic  $p= 0,689$ ;  $OR=1, 67$  and  $95\% CI=0, 31-8, 74$ . Vegetables consumption 26.7% with statistic  $p=0,678$ ;  $OR=0, 57$  and  $95\% CI=0, 11-2, 93$ . Alcohol consumption 3.3% with statistic  $p= 1,000$ ;  $OR=0$  and  $95\%CI=0$ .

**Table 3: Relationship between hypertension risk factors and hypertension incidence**

Risk Factors	Hypertension				OR	95%	P Value
	YES		NO				
	(n-22)	(n=8)					
	N	%	n	%			
<b>Sports</b>							
Yes	2	6.7	0	0	0	0	1
No	20	66.7	8	26.7			
<b>Smoke</b>							
Yes	14	46.7	1	3.3	12.25	1.26-118.36	0.035
No	8	26.7	7	23.3			
<b>Exposed to cigarette smoke</b>							
Yes	19	63.3	6	20.2	2.11	0.28-15.77	0.466
No	3	10	2	6.7			
<b>Drink coffee</b>							
Yes	16	53.3	3	10	4.44	0.80-24.61	0.104
No	6	20.2	5	16.7			
<b>Drink alcohol</b>							
Yes	1	3.3	0	0	0	0	1
No	21	70	8	26.7			

<b>Consumption of vegetables</b>							
Yes	14	46.7	4	13.3	0.57	0.11-2.93	0.678
No	8	26.7	4	13.3			
<b>Salt consumption</b>							
Yes	18	60	7	23.3	0.64	0.06-6.80	1
No	4	13.3	1	3.3			
<b>Consumption of fat</b>							
Yes	19	63.3	6	20	2.11	0.28-15.77	0.589
No	3	10	2	6.7			
<b>Nutritional status</b>							
Not Good	11	36.7	5	16.7	1.67	0.31-8.74	0.689
Good	11	36.7	3	10			
<b>Gender</b>							
Male	14	46.7	4	13.3	0.57	0.11-2.93	0.678
Female	8	26.7	4	13.3			

Exercise. This study doesn't show correlations between exercise and hypertension prevalence ( $p=1,000$ ). This result is resembled with study of (Primatesta 2001) that explained lack of exercise is not going to create hypertension (Primatesta, Falaschetti, Gupta, Marmot & Poulter, 2001).

Smoking habits. This study shows correlations between smoking habits and hypertension ( $p=0,035$ ), whereas smoking habits makes incidence of hypertension increase 12.25 time higher than nonsmokers. This result is resembled with study of Rahajeng which explained smoking habits increase the risk of hypertension (Sihombing, 2010). Nicotine in cigarette causes periphery vasoconstriction and kidney vessels that will increase the blood pressure. Smoking 1 cigarette per day will increase your blood pressure 10-25 mmHg and increase your heart beat 5-20 times per minute (Price, Wilson, Sitepoe, 2006). Heavy smokers is related to malignancy hypertension and the risk of renal artery stenosis that lead arteriosclerosis. This mentioned by dr. Thomas S Bowman of Brigmans and Women's hospital in his study (Bowman, *et al.* 2007).

Expose to cigarettes smoke. Statistic testing in this study shows no correlations ( $p=0,466$ ). Even the data

shows respondents with hypertension whom exposed to cigarette smoke are more than respondents whom not exposed to cigarette smoke. This result is resemble with study of (Vozoris & Laugheed 2008) that explained cigarette smoke exposure will increase the possibility of having hypertension than those who are not (Vozoris & Loughheed 2008). American Heart Association also declares after a few minutes expose to cigarette smoke can elevate blood pressure, because cigarette smoke is one of the causes of arteriosclerosis (Mahmud & Feely, 2001).

Same result came from study of (Mahmud & Feely 2003) which explained cigarette smoke exposure is relevant to blood pressure increases (Klag, Wang, Meoni, Brancati, Cooper, Liang *et al.* 2002).

Coffee consumption. Although the percentage respondents with hypertension with coffee consumption is higher than no consumption, but it doesn't show on statistic testing ( $p=0,104$ ). Even though coffee consumption will increase the chance of hypertension, as 4.44 times more than respondents who don't consume coffee. According to several studies over consumption on coffee per day can increase blood pressure. Michael J. Klag et al reported respondents who consume coffee 1-2 cups per day show higher blood pressure than with no consumption of coffee (Klag, Wang, Meoni, Brancati, Cooper, Liang, *et al.* 2002). Caffeine in coffee has effect on blood pressure acutely especially to patients with hypertension (Mahmud, Feely, 2001). The biological mechanism happens when caffeine binds adenosine receptors which activated sympatric neurons system by elevating catecholamine's plasma concentration and stimulate adrenaline gland and cortisol secretion (Zhenzhen, Gang, Benjamin, Lawrence, Liwei. 2011) the end result is vasoconstriction and peripheral total retention elevation and increase blood pressure (Klag, Wang, Meoni, Brancati, Cooper, Liang, *et al.* 2002).

Alcohol consumption. This study doesn't show the same result with (Puddey, 2006). (Puddey, 2006) explained the potential risk of hypertension is increase with alcohol consumption (Puddey, Beilin. 2006). This difference possibly caused by the level of alcohol consumption is still low among the employees Cracker Factory Haji Oman, so in statistic testing the result is insignificant.

Vegetables consumption. This study shows among respondents who has hypertension with vegetables consumption is higher (46.7%) and statistically irrelevant ( $p=0,678$ ). It shows vegetables consumption is not enough to prevent hypertension, need adequate amount of consumption. (Rosihan and Anwar 2014) explained inadequate fruits and vegetables consumption has risk five times of having hypertension (OR=5,3) compare with adequate consumption. (Sumaerih 2006) studied in (Indramayu and Lu Wang *et al.* 2008) studied in Boston, proved higher consumption of potassium can lower blood pressure (Anwar, 2014).

Sodium consumption. Statistic testing in this study doesn't show correlation ( $p=1.000$ ) even though 60% of respondents with sodium consumption are having hypertension which are higher than who don't consume sodium. WHO suggests sodium restriction less than 6 grams per day (2400 mg sodium). Excess sodium ingredients especially in form of sodium chloride can cause body fluid imbalance and hypertension. This result is resemble with study on fisherman of Bajo Tribe in Tasipi Island Muna County (2015) which explained hypertension incidence is higher to those who consume more sodium (Elvivin, dkk. 2016).

Fat consumption. This study doesn't show any correlations between hypertension with fat consumption ( $p=0,589$ ). Even though the number of hypertension with fat consumption higher (63.3%) than who don't consume fat (10.0%), this condition will increase the prevalence of hypertension as 2.11 times more. Other studies show correlation between fat consumption with primary hypertension because fats can elevate LDL level from food, then cause plaque in blood vessels. The more LDL aggregates on arterial wall will increase inflammation process stimuli and apoptosis response. This condition will damage the vessel's surface and elevate blood pressure (Kumbla, 2016).

Nutrition status. This study doesn't show any correlation between hypertension with poor nutrition status or good nutrition status. This result is not the same with (Rahmani *et al.* 2015) which explained one of controllable risk factor to hypertension is obesity or over weight. Obesity increases the risk 2 to 6 times higher of having hypertension than ideal weight. And

Framingham explained obesity has 10 times higher of having hypertension (Dhianningtyas & Hendrati, 2006).

Gender. This study involved more male respondents than female. This study is also resembled with study of (Rahajeng 2009). (Rahajeng 2009) showed higher case in men perhaps caused by unhealthy habits such as smoking, alcohol consumption, unsatisfied job and unemployment (Rahajeng Tuminah, Sulistyowati, 2009).

## CONCLUSIONS

Based on data analysis on statistic testing, found correlation between smoking habits risk factor to hypertension incidence ( $p=0.035$ ) with OR hypertension incidence to smoker 12.25 (95%CI = 1.26-118.36), and risk factor of lack of exercise, cigarette smoke exposure, coffee and alcohol consumption, low intake vegetables, sodium and fat consumption, under nourished and male gender have no correlation to hypertension incidence. Even though data show several factors affect incidence of hypertension, such as lack of exercise, cigarette smoke exposure, coffee and vegetables consumption, sodium and fat consumption. Smoking habits among employees Crackers Factory Haji Oman is very prominent, which need special attention since the lack of knowledge on smoking habits which can cause hypertension.

## RECOMMENDATIONS

1. For Primary Healthcare on Kresek County is able to use this study as base to run Programs on Prevention Disease, to set the strategies in preventing and handling hypertension.
2. For people to promote prevention on risk factors of hypertension completely and continuously so hypertension can be avoided and to minimize its risk factors.
3. For the next studies on hypertension can use this study as adjuvant information and can enhance the study on other risk factors.

## ACKNOWLEDGEMENT

Highest gratitude to Primary Healthcare Kresek County, Haji Oman as the owner of Cracker Factory and its employees as respondents of this study.

## REFERENCES

- Arif, M. (2015). *Kapita Selektta Kedokteran Edisi Ketiga Jilid I: Nefrologi dan Hipertensi*. Jakarta: Media Aesculapius FKUI.
- Badan Penelitian dan Pengembangan Kementerian Kesehatan RI. 2013. Riset Kesehatan Dasar (RISKESDAS) Tahun 2013. *Balitbang Kemenkes RI*. Available at: <http://www.depkes.go.id/resources/download/general/Hasil%20Riske%20sdas%202013.pdf>
- Bickley, L.S. (2009). *Bates buku ajar pemeriksaan fisik & riwayat kesehatan*. 8<sup>th</sup> edition. Jakarta: EGC.
- Bowman, T.S., Gaziano, J.M., Buring, J.E. & Sesso, H.D. (2007). A Prospective Study of Cigarette Smokey And Risk of Inciden Hypertension In Bringham And Women Hospital Massachusetts. *Journal of the American College of Cardiology*. 50(21) pp:1-3.
- Dhianningtyas, Y. & Lucia, Y.H. (2006). Resiko Obesitas, Kebiasaan Merokok, dan Konsumsi Garam Terhadap Kejadian Hipertensi pada Usia Produktif. *The Indonesian Journal of Public Health*. 2(3) pp: 105-109
- DPR RI. 2003. *Undang-Undang Tentang Ketenagakerjaan*. Dewan Perwakilan Rakyat Republik Indonesia. Available at: [http://www.dpr.go.id/jdih/perkara/id/196/id\\_perkara/469](http://www.dpr.go.id/jdih/perkara/id/196/id_perkara/469)
- Elvivin, E., Lestari, H. & Ibrahim, K. (2016). Analisis Faktor Resiko Kebiasaan Mengonsumsi Garam, Alkohol, Kebiasaan Merokok dan Minum Kopi Terhadap Kejadian Hipertensi Pada Nelayan Suku Bajo di Pulau Tasipi Kabupaten Muna Barat tahun 2015. *Journal Ilmiah Mahasiswa Kesehatan Masyarakat*. 1(3) pp:1-12
- Hanum, N H. (2014). Faktor Risiko Hipertensi pada Pekerja Garmen Wanita. Bogor: Departemen Gizi Masyarakat, Institut Pertanian Bogor. *Syarif Hidayatullah Jakarta*. pp:1-132
- Hawari, D. (2001). *Manajemen Stres, Cemas, dan Depresi*. Jakarta: Fakultas Kedokteran Universitas Indonesia.

- James, P.A., Oparil, S., Carter, B.L., Cushman, W.C., Dennison-Himmelfarb, C., Handler, J., Lackland, D.T., LeFevre, M.L., MacKenzie, T.D., Ogedegbe, O., Smith, S.C., Svetkey, L.P., Taler, S.J., Townsend, R.R., Wright, J.T., Narva, A.S. & Ortiz, E. (2014). Evidence Based Guideline for The Management of High Blood Pressure in Adults: Report From The Panel Members Appointed to The Eighth Joint National Committee (JNC 8). *The Journal of the American Medical Association*. 311(5)pp:507-5-20
- Kemendes RI. 2013. Permenkes RI No 30 Tahun 2013 Tentang Pencantuman Informasi Kandungan Gula, Garam, dan Lemak Serta Pesan Kesehatan Untuk Pangan Olahan dan Pangan Siap Saji. Jakarta: Depkes RI. available at:<http://peraturan.go.id/permen/kemendes-nomor-30-tahun-2013-11e44c50c451abb0a9ad313233303530.html>
- Kementrian Kesehatan RI. 2017. Profil Kesehatan Indonesia Tahun 2016. Jakarta:Depkes RI. available at: <http://www.depkes.go.id/resources/download/pusdatin/profil-kesehatan-indonesia/Profil-Kesehatan-Indonesia-2016.pdf>
- Klag, M.J., Wang, N.Y., Meoni, L.A., Brancati, F.L., Cooper, L.A., Liang, K.Y., Young, J.H. & Ford, D.E. (2002). Coffee Intake and Risk of Hypertension. *JAMA Internal Medicine*; 162(6) pp: 657- 662.
- Kumbla D. 2016. A Study of Salt and Fat Consumption Pattern in Regional Indian Diet among Hypertensive and Dyslipidemic Patients. SCRIPT study, India, *Journal of Association of Physicians India* 64(12) pp: 47-54
- Mahmud, A., Feely, J. (2003). Effect of smoking on arterial stiffness and pulse pressure amplification. *Hypertension*. 41(1) pp:183-187.
- Mahmud, A., Feely, J. (2001). Acute effect of caffeine on arterial stiffness and aortic pressure waveform. *Hypertension*. 2001; 38(2) pp: 227–231.
- Price, SA., Wilson LM. & Sitepoe, M. (2006). Usaha Mencegah Bahaya Merokok. Cetakan I. Jakarta: PT. Gramedia Widiasarana Indonesia. Patofisiologi: Konsep Klinis Proses- Proses Perjalanan Penyakit, 6<sup>th</sup> ed. Gangguan Sistem Kardiovaskular. Jakarta: Penerbit Buku Kedokteran EGC.
- Primates, P., Falaschetti, E., Gupta, S., Marmot, M.G. & Poulter, N.R. (2001). Association between smoking and blood pressure evidence from the health survey for England. *Hypertension*, 37(2), pp. 187-193.
- Puddey, I.B. & Beilin, L.J. 2006. Alcohol is bad for blood pressure. *Clinical and Experimental Pharmacology and Physiology*, 33(9), pp. 847-852.
- Puskesmas Kresek. 2017. Laporan Profil Kesehatan Kecamatan Kresek Tahun 2017. Pusat Kesehatan Masyarakat Kecamatan Kresek, Kabupaten Tangerang. Available at: <https://www.scribd.com/document/370860235/03-Lampiran-Profil-Puskesmas-Kresek>
- Rahajeng, E. & Tuminah, S. (2009). Prevalensi Hipertensi dan Determinannya di Indonesia. *Artikel Penelitian Maj Kedokt Indon*. 59(12) pp: 580-587
- Rahmani, F., Ranjbar, F., Ebrahimi, H. & Hosseinzadeh, M. (2015) The Effects of Group Psychoeducational Programme on Attitude toward Mental Illness in Families of Patients with Schizophrenia, 2014. *Scandinavian Journal of Caring Sciences*. 4(3) pp:243–251
- Rosihan, A., (2014). Konsumsi Buah Dan Sayur Serta Konsumsi Susu Sebagai Faktor Risiko Terjadinya Hipertensi Di Puskesmas S. Parman Kota Banjarmasin. *Journal Skala Kesehatan*. 5(1).
- Sherwood, L. (2012). *Fisiologi Manusia dari Sel ke Sistem*. Pambuluh dan Tekanan Darah. Jakarta: EGC.
- Sigarlaki, H. J. O. (2014). *Faktor – faktor resiko penderita hipertensi di RSU FK- UKI*. Program Studi Pascasarjana Ilmu Kesehatan Masyarakat: Jakarta.
- Sihombing, M. (2010). Hubungan perilaku merokok, konsumsi makanan/minuman, dan aktivitas fisik dengan penyakit hipertensi pada responden obes usia dewasa di Indonesia. *Maj Kedokt Indonesia*,

60 (9), pp: 406-412.

Vozoris, N., & Lougheed, Md. (2008). Second-hand Smoke Exposure in Canada: Prevalence, Risk Factors, and Association with Respiratory and Cardiovascular Diseases. *Canada Respiratory Journal* 15(5), pp: 263-269.

Zhenzhen, Z., Gang, H., Benjamin, C., Lawrence, A. & Liwei. C. (2011). Habitual Coffee Consumption and Risk of Hypertension: A Systematic Review and Meta-Analysis of Prospective Observational Studies. *American Journal of Clinical Nutrition*. 93(6)pp:1212-1219