

The Effect of Psychosocial Stress on the Incidence of Hypertension in Rural and Urban Communities

Pengaruh Stres Psikososial terhadap Kejadian Hipertensi pada Masyarakat Pedesaan dan Perkotaan

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ABSTRACT

The prevalence of hypertension in Indonesia increased to 34.1% in 2018. Hypertension incidence was higher in rural than urban. Psychosocial stress was hypertension risk factors. Individuals with psychosocial stress 3 times at risk get hypertension. The purpose was to determine effect of psychosocial stress on hypertension in rural and urban communities. A cross sectional study design with secondary data IFLS 5 in 2014. Sample was respondents of IFLS 5 who ≥ 15 years old and had blood pressure measurement data. The sample size was 10.008 in rural and 16,057 urban. Data analysis use complex sample as secondary data analysis technique by considering weighting when analyzing data. The results showed the hypertension was 29.7% in rural and 31.3% in urban. In rural, psychosocial stress increases the risk of hypertension after being controlled for age, sex, education, economic, marital status and BMI (PR = 1,108; 95% CI = 1,016-1,209). In urban, psychosocial stress increases the risk of hypertension after being controlled by age, sex, education, economic, marital status, BMI and tobacco consumption (PR=1,174; 95% CI=1,032-1,335). Psychosocial stress was a risk factor for hypertension. The importance of providing hypertension prevention education such as stress management techniques to prevent hypertension in integrated assistance post (Posbindu).

Keywords: Psychosocial stress, hypertension, rural, urban

ABSTRAK

Prevalensi hipertensi di Indonesia meningkat menjadi 34,1% tahun 2018. Kejadian hipertensi lebih tinggi pada masyarakat pedesaan dibanding perkotaan. Faktor risiko hipertensi antara lain stres psikososial. Individu dengan stres psikososial berisiko 3 kali lebih besar menderita hipertensi. Tujuan penelitian mengetahui pengaruh stres psikososial terhadap hipertensi pada masyarakat pedesaan dan perkotaan. Desain penelitian cross sectional dengan data sekunder IFLS 5 tahun 2014. Sampel penelitian adalah responden IFLS 5 yang berusia ≥ 15 tahun dan memiliki data pengukuran tekanan darah. Besar sampel sebanyak 10.008 responden pedesaan dan 16.057 responden perkotaan. Analisis data menggunakan complex sample analysis yaitu teknik analisis data sekunder dengan mempertimbangkan pembobotan pada saat analisa data. Hasil menunjukkan prevalensi hipertensi sebanyak 29,7% di pedesaan dan 31,3% di perkotaan. Pada masyarakat pedesaan, stres psikososial meningkatkan risiko hipertensi setelah dikontrol variabel usia, jenis kelamin, status pendidikan, status ekonomi, status perkawinan dan IMT (PR=1,108; 95% CI=1,016-1,209). Pada masyarakat perkotaan, stres psikososial meningkatkan risiko hipertensi setelah dikontrol variabel usia, jenis kelamin, status pendidikan, status ekonomi, status perkawinan, IMT dan konsumsi tembakau (PR=1,174; 95% CI=1,032-1,335). Stres psikososial adalah faktor risiko hipertensi. Pentingnya memberikan edukasi pencegahan hipertensi seperti teknik manajemen stres sebagai bagian dari upaya mencegah hipertensi pada program Posbindu.

Kata kunci: Stres psikososial, hipertensi, pedesaan, perkotaan

INTRODUCTION

Hypertension is the first rank for cause of death every year, as the World Health Organization estimates 1.13 billion sufferers worldwide, which is predicted to affect about 1.5 billion adults in 2025. The prevalence of patients in Southeast Asia amongst the age group of >18 years is estimated at 25.3% male and 24.2% female.¹ Furthermore, the basic Health Research in 2018 showed an increase in the prevalence of non-communicable diseases, encompassing cancer, stroke, chronic kidney disease, diabetes mellitus, and hypertension compared with data collected in 2013. Specifically, the prevalence of hypertension in Indonesia, which was obtained through measurements in the age group of ≥ 18 years increased from 25.8% in 2013 to 34.1% in 2018. This information was obtained through the questionnaire, including individuals diagnosed by health professionals (8.4%) and those currently taking medication (8.8%).²

The epidemiology of cardiovascular diseases driven by demographic and socioeconomic changes, which affect life habits, increases the risk of hypertension, including mental stress (psychosocial stress), tobacco consumption, physical activity, obesity and various dietary patterns.³ A previous study by Peltzer and Pengpid showed a 1.17 times greater risk in individuals experiencing from depressive symptoms, than otherwise.⁴ Eashwar, *et al* established the presence a significant relationship between the psychosocial stress variables (depression, anxiety and stress) and the 3 times greater risk of suffering hypertension. Hence, the concurrent occurrence of stress and anxiety lead to uncontrolled hypertension.⁵

Previous research reported that the contribution of urbanization factor, due to the effects on lifestyle patterns, characterized by a decline in physical activity, changes in diet and increased stress levels.^{6,7} Furthermore, some researches have demonstrated a higher incidence amongst the rural than urban communities,⁶ while other reported on the 1.4 times greater at risk of suffering from stress in urban areas.⁸ This was congruent with data obtained in Indonesia from the Basic Health Research, through measurements at 26.1%, compared to the rural areas, which recorded 25.5%.² Therefore, this study is aimed at determining the effect of psychosocial stress on the incidence of hyperten-

sion in rural and urban communities of Indonesia.

MATERIALS AND METHODS

This is a quantitative study with cross sectional study design, use secondary data obtained from IFLS 5 in 2014. The sampling method was performed according to the technique in the IFLS 5 Survey data, characterized by multistage random sampling, therefore consisting of all previous respondents. Furthermore, the inclusion criteria comprises individuals aged ≥ 15 years with a blood pressure measurement data, which was fulfilled by 10,008 and 26,065 respondents for rural and urban communities, respectively. The information obtained were evaluated using a complex sample analysis approach, which is commonly used on secondary data processing of survey results, on instances where simple random sampling was not used. This was performed by considering the weight of each analysis performed, with the intention of providing similar chances to choose a sample, subsequently ensuring the production of more accurate results. In addition, chi-square test for complex samples was the statistical tool adopted at the bivariate stage, while multiple logistic regression was used at the multivariate stage, followed by the presentation of research data in tabular and narrative forms.

The dependent variable is the history of hypertension in respondents, which was grouped into two, encompassing present and absent. The respondents were reported to suffer from hypertension on instances where one or all of the following conditions are fulfilled, including an average blood pressure of $\geq 140/90$ mmhg after 3 times measurement, history of illness or taking affiliated medication. Conversely, the main independent variable was psychosocial stress, confirmed to be present when all of the following conditions are fulfilled; a total score of psychological conditions ≥ 10 , life satisfaction within the satisfied category and active participation in society.

RESULTS

The proportion of respondents with hypertension was 29.7% and 31.4% for rural and urban areas, with the proportion experiencing psychosocial stress being 13.4% and 11%, respectively. In addition, majorities in rural areas (63.7%) were

Table 1. Frequency Distribution of Respondents Characteristics in Rural and Urban Areas

Variable	Rural		Urban	
	n= 10.008	%	n= 16.057	%
Hypertension Incidence				
Yes	2.969	29,7	5.027	31,3
No	7.039	70,3	11.030	68,7
Psychosocial Stress				
Yes	1.338	13,4	1.764	11
No	8.670	86,6	14.293	89
Age				
≥65 years old	691	6,9	902	5,6
45-64 years old	2.946	29,4	4.910	30,6
15-44 years old	6.371	63,7	10.245	63,8
Gender				
Male	4.916	49,1	7.638	47,6
Female	5.092	50,9	8.419	52,4
Education Status				
No school	626	6,3	423	2,6
School	9328	93,7	15.634	97,4
Economic Status				
Low	4.230	42,3	6.485	40,4
High	5.778	57,7	9.572	59,6
Marital Status				
Widower / widow	884	8,8	1.435	8,9
Marry	7.673	76,7	11.408	71
Single	1.451	14,5	3.214	20
Job Status				
Does not work	3.276	32,7	5.565	34,7
Work	6.732	67,3	10.492	65,3
Body mass index				
Obesity	639	6,4	1.528	9,5
Overweight	2.144	21,4	4.294	26,7
Normal	5.902	59	8.478	52,8
Low Weight	1.323	13,2	1.757	10,9
Physical Activity				
Less	4.451	44,5	8.251	51,4
Enough	5.557	55,5	7.806	48,6
Tobacco Consumption History				
Yes	3.499	35	4.767	29,7
Ever	444	4,4	846	5,3
Never	6.065	60,6	10.444	65
Fat Consumption				
Often	5.741	57,4	7.332	45,7
Rarely	4.267	42,6	8.725	54,3

Source: Secondary Data of IFLS 5, 2014

aged 15 to 44 years, 57.7% had a high economic status, 50.9% were women, 76.7% had a married status, 67.3% were workers, and 59% had normal BMI status. Conversely, most of the respondents in urban areas (63.8%) were aged 15 to 44 years,

59.6% had high economic status, 52.4% were women. Also, other characteristics include married status (71%), workers (65.3%), and normal BMI status (52.8%). Furthermore, respondents in the rural areas (55.5%) engaged in sufficient

Table 2. Risk Factors of Hypertension Incidence in the Rural Areas

Variable	Hypertension				Total		p value	PR (95% CI)
	Yes		No		n	%		
	n	%	n	%				
Psychosocial Stress								
Yes	454	34	884	66	1.338	100	<0,001	1,17 (1,12-1,22)
No	2.515	29	6.155	71	8.670	100		
Age								
≥65 years old	464	67,1	227	32,9	691	100	<0,001	9,32 (8,11 – 10,71)
45-64 years old	1.361	46,2	1.585	53,8	2.946	100	<0,001	3,92 (3,59-4,28)
15-44 years old	1.144	18	5.227	82	6.371	100	-	Reference
Gender								
Male	1.380	28,1	3.536	71,9	4.916	100	<0,001	0,89 (1,80-1,99)
Female	1.590	31,2	3.502	68,8	5.092	100		
Education Status								
No school	333	53,2	293	46,8	626	100	<0,001	1,89 (1,80-1,99)
School	2.636	28,1	6.746	71,9	9.382	100		
Job Status								
Does not work	932	28,4	2.334	71,6	3.276	100	0,031	0,94 (0,88-0,99)
Work	2.038	30,3	4.694	69,7	6.732	100		
Marital Status								
Widower / widow	470	53,1	414	46,9	884	100	<0,001	8,24 (7,03-9,65)
Marry	2.324	30,3	5.349	69,7	7.673	100	<0,001	3,16 (2,75-3,63)
Single	176	12,1	1.275	87,9	1.451	100	-	Reference
Economic Status								
Low	1.280	30,3	2.950	69,7	4.230	100	0,184	1,03 (0,98-1,09)
High	1.689	29,2	4.089	70,8	5.778	100		
Body mass index								
Obesity	321	50,3	318	49,7	639	100	<0,001	2,94 (2,56-3,37)
Overweight	864	40,3	1.280	59,7	2.144	100	<0,001	1,96 (1,81-2,12)
Normal	1.512	25,6	4.390	74,4	5.902	100	-	Reference
Low Weight	271	20,5	1.052	79,5	1.323	100	<0,001	0,75 (0,68-0,82)
Physical Activity								
Less	1.310	29,4	3.141	70,6	4.451	100	0,530	0,98 (0,94-1,03)
Enough	1.660	29,9	3.897	70,1	5.557	100		
Fat Consumption								
Often	0,985	31,5	3.933	68,5	5.741	100	<0,001	1,16 (1,10-1,21)
Rarely	1.161	27,2	3.106	72,8	4.267	100		

Source: Secondary Data of IFLS 5, 2014

physical activity, did not have a history of tobacco consumption (60.6%), and often consume fat by 57.4%, which was 51.4% 65% , and 54.3%, respectively for the urban community (Table 1).

A significant relationship was established between psychosocial stress, age, sex, education, job, and marital status, body mass index, as well as history of tobacco and fat consumption, with the hypertension incidence in rural areas (Table 2), while a similar correlation was observed in the urban community, with the addition of economic

status (Table 3).

Therefore, psychosocial stress is strongly affiliated with the incidence of hypertension, due to the control variables of age, gender, education status, economic status, marital status and body mass index (BMI) in the rural community, with the PR adjusted value of 1.108 (95% CI 1.016-1.209) (Table 4). Conversely, a similar association was established in the urban community, following the aforementioned variables, alongside history of tobacco consumption, with a PR adjusted value of

Table 3. Risk Factors of Hypertension Incidence in the Urban Areas

Variable	Hypertension				Total		p value	PR (95% CI)
	Yes		No		n	%		
	n	%	n	%				
Psychosocial Stress								
Yes	601	34,1	1.163	65,9	1.764	100	0,022	1,10 (1,01-1,19)
No	4.426	31	9.867	69	14.293	100		
Age								
≥65 years old	631	70	271	30	902	100	<0,001	10,74 (9,03-12,77)
45-64 years old	2.570	52,3	2.340	47,7	4.910	100	<0,001	5,07 (4,68-5,48)
15-44 years old	1.826	17,8	8.419	82,2	10.245	100	-	Reference
Gender								
Male	2.296	30,1	5.342	69,9	7.638	100	<0,001	0,92 (0,89-0,97)
Female	2.731	32,4	5.688	67,6	8.419	100		
Educational Status								
No school	249	59	173	41	422	100	<0,001	1,93 (1,70-2,19)
School	4.778	30,6	10.857	69,4	15.635	100		
Job Status								
Does not work	1.828	32,8	3.737	67,2	5.565	100	0,005	1,08 (1,02-1,13)
Work	3.199	30,5	7.293	69,5	10.492	100		
Marital Status								
Widower / widow	789	55	646	45	1.435	100	<0,001	8,57 (7,46-9,85)
Marry	3.836	33,6	7.572	66,4	11.408	100	<0,001	3,55 (3,18-3,96)
Single	401	12,5	2.813	87,5	3.214	100	-	Reference
Economic Status								
Low	2.183	33,7	4.302	66,3	6.485	100	<0,001	1,13 (1,08-1,19)
High	2.844	29,7	6.728	70,3	9.572	100		
Body mass index								
Obesity	791	51,8	737	48,2	1.528	100	<0,001	3 (2,69-3,34)
Overweight	1.766	41,1	2.528	58,9	4.294	100	<0,001	1,95 (1,79-2,13)
Normal	2.233	26,3	6.245	73,7	8.478	100	-	Reference
Low Weight	237	13,5	1.520	86,5	1.757	100	<0,001	0,44 (0,36-0,53)
Physical Activity								
Less	2.599	31,5	5.652	68,5	8.251	100	0,642	1,01 (0,96-1,07)
Enough	2.428	31,1	5.378	68,9	7.806	100		
Tobacco Consumption History								
Yes	1.345	28,2	3.422	71,8	4.767	100	<0,001	0,86 (0,80-0,93)
Ever	417	49,3	429	50,7	846	100	<0,001	2,14 (1,83-2,47)
Never	3.265	31,3	7.179	68,7	10.444	100	-	Reference
Fat Consumption								
Often	2.552	34,8	4.780	65,2	7.332	100	<0,001	1,23 (1,16-1,29)
Rarely	2.475	28,4	6.250	71,6	8.725	100		

Source: Secondary Data of IFLS 5, 2014

1.174 (95% CI 1.032-1.335) (Table 5).

DISCUSSION

The results of multivariate analysis in rural communities showed the significant influence of psychosocial stress variables on the incidence of hypertension, due to the control variables of

age, sex, education, economic and marital status, as well as BMI. Therefore, cause a 1,108 times greater risk. Meanwhile, a similar correlation was also observed in urban communities, based on the aforementioned variables, alongside history of tobacco consumption. Hence, people suffering from psychosocial stress have a 1.174 times greater risk

Table 4. Multivariate Analysis: The Relationship of Psychosocial Stress with the Hypertension Incidence after being controlled by Confounding Variables in Rural Areas

Variable	p value	PR	95% CI		p value	PR	95% CI	
		Crude	Lower	Upper		Adjusted	Lower	Upper
Psychosocial Stress	0,016	1,114	1,021	1,216	0,021	1,108	1,016	1,209
Age								
≥65 years old	<0,001	9,835	8,346	11,589	<0,001	9,834	8,386	11,531
45-64 years old	<0,001	3,563	3,224	3,937	<0,001	3,596	3,250	3,979
15-44 years old	-	-	-	-	-	Reference	-	-
Gender	<0,001	1,204	1,090	1,330	0,005	1,151	1,044	1,269
Educational Status	<0,001	1,185	1,084	1,294	<0,001	1,190	1,091	1,297
Economic Status	0,005	1,192	1,054	1,348	<0,001	1,194	1,099	1,297
Marital Status								
Widower / widow	<0,001	2,074	1,712	2,514	<0,001	2,072	1,711	2,509
Marry	<0,001	1,430	1,227	1,667	<0,001	1,437	1,231	1,678
Single	-	-	-	-	-	Reference	-	-
Job Status	0,917	0,994	0,881	1,121	-	-	-	-
BMI								
Obesity	<0,001	6,746	5,732	7,939	<0,001	3,834	3,309	4,441
Overweight	<0,001	2,164	1,998	2,344	<0,001	2,171	2,001	2,355
Normal	-	-	-	-	-	Reference	-	-
Low Weight	<0,001	0,567	0,513	0,627	<0,001	0,566	0,512	0,625
Physical Activity	0,043	0,926	0,860	0,998	-	-	-	-
Tobacco Consumption History								
Yes	0,026	0,899	0,820	0,987	-	-	-	-
Ever	0,124	1,116	0,970	1,284	-	-	-	-
Never	-	-	-	-	-	Reference	-	-
Fat Consumption	0,055	1,059	0,999	1,124	-	-	-	-

Source: Secondary Data of IFLS 5, 2014

of experiencing hypertension. The study outcome supports the previous report by Peltzer and Pengpid, which attributed a 1.17 times more significant risk to psychosocial stress obtained from depressive symptoms.⁴ In addition, there is also substantial correlation with depression, anxiety and stress, collectively by a 3 times greater chance,⁵ which was 2.2 times for individuals experiencing mental emotional disorders (stress).⁹

The results presents psychosocial stress as an influential factor on the incidence of hypertension in both rural and urban communities, at a proportion of 13.4%, and 11%, respectively. Furthermore, psychosocial stress refers to any social condition in the form of events that cause changes in a person's life, followed by indirect adaptation to overcome the stressors. This is possibly interpreted as a form of reaction in the individuals' body to of mental stress, as well as the burden of life.¹⁰ Conversely, stress is a condition that results from

transactions with the environment, subsequently leading to the perception of distance between the demands of a situation with biological, psychological and social system resources. These bodily responses to stressors, danger or challenges originate with an initial reaction in the hypothalamus, followed by chain reactions that occur through nerve fibers and biochemical reactions, and subsequently through the sympathetic autonomic nervous system. This, therefore, causes various modifications throughout the body, and the ultimate increase in blood pressure.¹¹

The risk of hypertension increases with the occurrence of psychosocial stress, which is observed to be higher in urban than rural communities, specifically characterized by the presence of closer family relationships. This is usually the basis of rural life systems, as against the more individualistic urban lifestyle, featuring the occurrence of interactions that are based on factors of

Table 5. Multivariate Analysis: The Relationship of Psychosocial Stress with the Hypertension Incidence after being controlled by Confounding Variables in Urban Areas

Variable	p value	PR Crude	95% CI		p value	PR Adjusted	95% CI	
			Lower	Upper			Lower	Upper
Psychosocial Stress	0,018	1,169	1,028	1,330	0,015	1,174	1,032	1,335
Age								
≥65 years old	<0,001	8,722	7,213	10,546	<0,001	8,801	7,278	10,643
45-64 years old	<0,001	4,023	3,693	4,382	<0,001	4,043	3,711	4,404
15-44 years old	-	-	-	-	-	Reference	-	-
Gender	<0,001	1,337	1,182	1,512	<0,001	1,339	1,184	1,515
Educational Status	0,005	1,451	1,121	1,878	0,003	1,469	1,140	1,892
Economic Status	0,008	1,289	1,068	1,556	<0,001	1,280	1,169	1,401
Marital Status								
Widower / widow	<0,001	2,049	1,748	2,401	<0,001	2,068	1,760	2,431
Marry	<0,001	1,539	1,369	1,729	<0,001	1,551	1,380	1,743
Single	-	-	-	-	-	Reference	-	-
Job Status	0,897	0,987	0,812	1,200	-	-	-	-
BMI								
Obesity	<0,001	3,265	2,895	3,682	<0,001	3,271	2,900	3,690
Overweight	<0,001	1,855	1,690	2,037	<0,001	1,855	1,690	2,036
Normal	-	-	-	-	-	Reference	-	-
Low Weight	<0,001	0,462	0,373	0,572	<0,001	0,463	0,374	0,574
Physical Activity	0,555	1,026	0,942	1,118	-	-	-	-
Tobacco Consumption History								
Yes	0,036	0,873	0,770	0,991	0,036	0,874	0,771	0,991
Ever	0,015	1,305	1,053	1,618	0,016	1,306	1,052	1,620
Never	-	-	-	-	-	Reference	-	-
Fat Consumption	0,068	1,080	0,994	1,172	-	-	-	-

Source: Secondary Data of IFLS 5, 2014

interest and social change. Furthermore, the observed modifications tend to ensue quickly, consequently leading to conflicts between groups, therefore causing hurt emotions and feeling, as well as disappointment and discomfort. Particularly, urban environments are characterized by congestion, pollution, crime and urbanization, which collectively influence the lifestyle, living demands, socioeconomic status and community dietary pattern, subsequently increasing the risk of psychosocial stress.¹²

Age is a closely related trigger for hypertension incidence, which increases along at the exponent of time, due to natural changes in the body that affect the heart, blood vessels and hormones.¹³ Therefore, the resulting decline in all aspects consequently affects social life and become a source of psychosocial stress. This interferes with the function of parasympathetic and sympathetic nerves, smooth muscles, external and internal se-

cretions, as well as individual awareness, which further increases the disease risk.¹⁴

Men are known to be more prone to hypertension than women, although the case tends to be reversed of both possess similar risk at the age of 45-64 years. This probability increases in women at menopause, resulting from hormonal factors,¹⁵ while men are generally more exposed to unsafe behaviors, including stress, alcohol and tobacco consumption. In addition, women behave differently by paying more often visits to health services, therefore providing greater opportunities for treatment.¹⁶ Specifically, older men tend to be exposed to more stress, which is possibly caused by various factors, e.g., job modification (retirement and unemployment), and economic factors, characterized by the requirement to seek income necessary to fulfill personal and family needs.¹⁷

Other factors influencing the incidence of psychosocial stress include low level of education

and high socioeconomic burden,¹⁴ which impacts on knowledge in understanding of a problem, leading to stress resulting from the limited information obtained.¹⁸ This effect is influenced by the presence of a gap between rural and urban areas, which is caused by various aspects, including access to school locations, facilities and infrastructure, as well as sources of teaching staff. This research established a correlation between an increase in the risk of hypertension with educational status, which was greater in urban than rural areas. Furthermore, the results indicated the inability for easy access, supporting infrastructures and adequate teaching staff to guarantee the acquisition of sufficient knowledge and the application of good behavior in urban communities, according to the theory of Lehendroff and Tracy's in Vito, *et al* which the influence of ability and will on an individuals' behavior.¹⁹

Financial problems and household needs have also been associated with stress, which is why people with high economic remuneration and a fixed income find it difficult managing finances properly. This occurs because of the increasing needs, which becomes a burden on the mind, subsequently causing stress.²⁰ Hence, the differences in economic status of individuals is seen from the propensity of homogeneity in rural communities, compared to the urban.¹² Based on this study outcome the risk of hypertension is greater in urban areas because of the relatively higher consumptive behavior, and more attention paid to lifestyle desires associated with prestige, as against the prioritization of basic needs in rural areas.

The hypertension risk is also related to marital status, as widowed individuals were identified to be more at risk in rural areas, which was higher for married people in urban areas. Rural communities tend to have a thicker culture, particularly relating to marriage at a young age.¹² Therefore, parents from villages and less economically inclined, leading to the assumption that marrying off children reduces the burden, which possibly helps. The negative impact is divorce, resulting from the lack of awareness regarding household responsibilities, often related to emotional maturity, increased maternal mortality rate, loss of educational opportunities and others.²¹ In addition, individuals with a marital status have an obligation to

the family and the environment, which sometimes triggers stress and increases blood pressure.²²

Stressful conditions are usually characterized by changes in appetite, leading to the manifestation of obesity and excess weight, resulting from the release of stress on food, while people with poor nutritional status further reduce in energy.²³ In addition, irregular dietary patterns have also been identified as risk factors in nutritional and food problems, leading to an imbalance of undernutrition and over nutrition.²⁴ Moreover, urban communities tend to work with limited mobility, including the practice of being in front of a computer, while heavier activities in the nature of farming is conducted more in rural settlements. Hence, a modification in dietary patterns encourages the incidence of obesity following urbanization habits, including the consumption of fast foods containing fat, salt and high level of calories.²⁵

Smoking has been adopted as an ineffective stress management strategy liked by many people, despite the negative effects. However, there is a marked upsurge in the statistics of smokers, especially in the young population, due to the assumption that it possesses calming functions in anxious and stressful situations.²⁶ Based on this research, the risk of hypertension is enhanced in individuals with a history of tobacco consumption in urban areas, while no correlation was identified in rural communities. However, studies have shown the capacity for smoking to ease anxiety, following the effects of nicotine present, although the incidence of dependence consequently increases stress levels in an individual. This practice in urban areas are not only based on necessity and pressure of friend at work, but also as a form of prestige, trends and a condition in social interactions. Conversely, life demands and stress levels are lesser in rural areas, making people living in the urban regions vent stresses to negative activities, including smoking, which is also supported by the continuously fading religious life.¹²

CONCLUSIONS AND RECCOMENDATION

Based on the result and discussion, psychosocial stress was identified as a risk factor for the incidence of hypertension, due to the following control variables, including age, sex, education,

economic, and marital status, as well as Body Mass Index (BMI) in rural communities. However, a similar study outcome was obtained in urban areas, which was based on the aforementioned variables, alongside a history of tobacco consumption. Hence, there is a need to take preventive actions in communities, through the implementation of healthy lifestyle, balanced dieting and the regular control the blood pressure. The quality improvement of Integrated Assistance Posts (*Posbindu*) is also possibly by providing interventions techniques that reduce stress, including its management, the practice of relaxation techniques and related health education, consequently enhancing the detection of hypertension threats caused by stress.

REFERENCES

1. WHO. Hypertension. [Online]. 2015. Available at: <http://www.who.int/topics/hypertension/en/>
2. Kemenkes RI. Hasil Utama Riset Kesehatan Dasar (Riskesdas) 2018. Jakarta: Kementerian Kesehatan RI; 2018.
3. Bhelkar S, Deshpande S, Mankar S & Hiwarkar. Association between Stress and Hypertension among Adults More Than 30 Years: A Case-Control Study. *National Journal of Community Medicine*. 2018;9(6):430–433.
4. Peltzer K, Pengpid S. The Prevalence and Social Determinants of Hypertension among Adults in Indonesia: A Cross-Sectional Population-Based National Survey. *International Journal of Hypertension*. 2018;2018:1-9.
5. V. M. A, E., S, G., R, U. Prevalence of Hypertension and its Association with Psychosocial Factors among Old Age Home Inmates in an Urban Area of Kancheepuram District, Tamil Nadu. *International Journal of Community Medicine and Public Health*. 2017;4(10):3712.-3720.
6. Daştan İ, Erem A, Çetinkaya V. Urban and Rural Differences in Hypertension Risk Factors in Turkey. *The Anatolian Journal of Cardiology*. 2017;18(1):39–47.
7. Oktavia F, Martini S. Besar Risiko Kejadian Hipertensi Berdasarkan Faktor Perilaku pada Tentara Nasional Indonesia (TNI). *Media Kesehatan Masyarakat Indonesia*. 2016;12(3):127–136.
8. Noorbala A.A, Faghihzadeh S, Kamali K, Yazdi SAB, Hajebi A, Mousavi M.T, et al. Mental Health Survey of the Iranian adult Population in 2015. *Archives of Iranian Medicine*. 2017;20(3):128–134.
9. Sihombing, M. Faktor yang Berhubungan dengan Hipertensi pada Penduduk Indonesia yang Menderita Diabetes Melitus (Data Riskesdas 2013). *Buletin Penelitian Kesehatan*. 2017;45(1):53–64.
10. Harfiantoko M, Kurnia E. Derajat Hipertensi Mempengaruhi Kualitas Tidur dan Stres Psikososial. *Jurnal STIKES RS Baptis Kediri*. 2013;6(2):1–12.
11. Ponto L. Hubungan antara Obesitas, Konsumsi Natrium, dan Stres dengan Kejadian Hipertensi pada Orang Dewasa di Puskesmas Tompaso Kabupaten Minahasa. *Jurnal Fakultas Kesehatan Masyarakat Universitas Sam Ratulangi*. 2016;4(2):115–129.
12. Soerjono S. *Sosiologi Suatu Pengantar*. Jakarta: Grafindo Pustaka; 2009.
13. Sundari, Lilies, Bangsawan M. Faktor-Faktor yang Berhubungan dengan Kejadian Hipertensi. *Jurnal Keperawatan*. 2015;11(2):216–223.
14. Wiraputra A. Stres pada Penduduk Lanjut Usia yang Menderita Hipertensi di Wilayah Kerja Puskesmas Tabanan Ii Kabupaten Tabanan Periode September-Oktober 2013. *Intisari Sains Medis*. 2015;3(1):51–57.
15. Rianti, Dwi ED. Analisis Kebiasaan Merokok terhadap Hipertensi pada Berbagai Kegiatan Aktifitas. *INOVASI*. 2018;20(2):95–103.
16. Peer N, Steyn K, Lombard C, Gwebushe N, Levitt N. A High Burden of Hypertension in the Urban Black Population of Cape Town: The Cardiovascular Risk in Black South Africans (CRIBSA) Study. *PLoS One*. 2013;8(11):1-11.
17. Sutanto. *Cegah dan Tangkal Penyakit Modern*. Yogyakarta: Andi Yogyakarta; 2010.
18. Bastable SB. *Perawat Sebagai Pendidik: Prinsip-Prinsip Pembelajaran dan Pengajaran*. Jakarta: EGC; 2012.
19. Vito B, Krisnani H, Resnawaty R. Kesenjangan Pendidikan Desa dan Kota. *Prosiding*

- Penelitian & Pengabdian Kepada Masyarakat. 2015;2(2):147–300.
20. Andria KM. Hubungan antara Perilaku Olahraga, Stress dan Pola Makan dengan Tingkat Hipertensi pada Lanjut Usia di Posyandu Lansia Kelurahan Gebang Putih Kecamatan Sukolilo Kota Surabaya. *Jurnal Promkes*. 2013;1(2):111–117.
 21. Mai, Tiara J. Tinjauan Yuridis terhadap Perkawinan Anak di Bawah Umur di Lihat dari Sudut Pandang Undang-Undang Nomor 1 Tahun 1974. *Lex Crim*. 2019;8(4):114–121.
 22. Heriyanto. Analisis Sosial Ekonomi yang Mempengaruhi Tingkat Fertilitas di Kota Balikpapan. Samarinda: Fakultas Ekonomi Universitas Mulawarman; 2011.
 23. Nadeak TA, Siagian A, Sudaryati E. Hubungan Status Stress Psikososial dengan Konsumsi Makanan dan Status Gizi Siswa SMU Methodist-8 Medan. *Jurnal Gizi, Kesehatan Reproduksi, dan Epidemiologi*. 2013;2(6):1–8.
 24. Irianto K. Gizi Seimbang dalam Kesehatan Reproduksi. Bandung: Alfabeta; 2014. pp. 1689–1699.
 25. Tahapary DL, De Ruiter K, Kurniawan F, Djuardi Y, Wang Y, Nurdin SME, et al. Impact of Rural-Urban Environment on Metabolic Profile and Response to a 5-Day High-Fat Diet. *Scientific Reports*. 2018;8(8149):1–9.
 26. Bawuna NH, Rottie J, dan Onibala F. Hubungan Antara Tingkat Stres dengan Perilaku Merokok pada Mahasiswa Fakultas Teknik Universitas Sam Ratulangi. *Jurnal Keperawatan UNSRAT*. 2017;5(2):1–8.