



# Profile and Lifestyle of Hypertensive Patients, Cardiovascular Comorbidity, and Complications in a Primary Health Center in Surabaya, Indonesia

Sulistiawati Sulistiawati<sup>1\*</sup>, Linda Dewanti<sup>1</sup>, Adikara Pagan Pratama<sup>1</sup>, Atika Atika<sup>1</sup>, Widati Fatmaningrum<sup>1</sup>, Djohar Nuswantoro<sup>1</sup>, Tan Nicko Octora<sup>2</sup>, Dyah Ayu Pradnyaparamitha<sup>2</sup>, Fahmi Aulia Rizqi<sup>2</sup>

<sup>1</sup>Department of Public Health and Preventive Medicine, Faculty of Medicine, Universitas Airlangga, Surabaya, Indonesia;

<sup>2</sup>Faculty of Medicine, Universitas Airlangga, Surabaya, Indonesia

## Abstract

**Edited by:** Sasho Stoleski

**Citation:** Sulistiawati S, Dewanti L, Pratama AP, Atika A, Fatmaningrum W, Nuswantoro D, Octora TN, Pradnyaparamitha DA, Rizqi FA. Profile and Lifestyle of Hypertensive Patients, Cardiovascular Comorbidity, and Complications in a Primary Health Center in Surabaya, Indonesia. Open Access Maced J Med Sci. 2020 Jun 03; 8(E):219-223. <https://doi.org/10.3889/oamjms.2020.4432>

**Keywords:** Hypertension; Examination; Treatment; Primary health care

**\*Correspondence:** Sulistiawati Sulistiawati, Department of Public Health and Preventive Medicine, Faculty of Medicine, Universitas Airlangga, Surabaya, Indonesia. E-mail: [sulistwt@hotmail.com](mailto:sulistwt@hotmail.com)

**Received:** 09-Feb-2020

**Revised:** 14-Apr-2020

**Accepted:** 04-May-2020

**Copyright:** © 2020 Sulistiawati Sulistiawati, Linda Dewanti, Adikara Pagan Pratama, Atika Atika, Widati Fatmaningrum, Djohar Nuswantoro, Tan Nicko Octora, Dyah Ayu Pradnyaparamitha, Fahmi Aulia Rizqi

**Funding:** This research did not receive any financial support

**Competing Interests:** The authors have declared that no competing interests

**Open Access:** This is an open-access article distributed under the terms of the Creative Commons Attribution-NonCommercial 4.0 International License (CC BY-NC 4.0)

**BACKGROUND:** Hypertension prevalence which increased in the last two decades in Indonesia depleted national expenditure. The government responded through many programs in educating the community and improving the primary health center (PHC). The engagement of patients and doctor's role in PHC was very important in managing the disease. Patient's lifestyles, comorbid, and the role of PHC, such as in early detection, examination, drug administration, and education, as well as screening for the complication, needs to be evaluated.

**AIMS:** This study aimed to analyze the profile and lifestyle of hypertensive patients and health services in PHC as one of the catastrophic diseases in Indonesia.

**MATERIALS AND METHODS:** This was a cross-sectional study design with total sampling. The study was held in one of the PHC in Surabaya from May 2018 until August 2018. The sample size was 104. Data were collected using questionnaires, physical, and laboratory examinations as well as secondary data from the medical record. The statistical analysis was performed at a significance  $p < 0.005$  using the Chi-square test.

**RESULTS:** The majority were women with age  $>60$  years and two-thirds of all hypertensive cases had uncontrolled blood pressure (69.2%). Laboratory results showed abnormalities: Dyslipidemia (50.5%), high fasting blood sugar (38.6%), and high uric acid (10.1%). Nearly one-third of patients (27.9%) already had abnormalities in the electrocardiography (ECG) since the procedure been done rarely. Contrarily, most of them committed to a healthy diet and taking the medication regularly in line with doctor's education when they visit PHC. Regarding exercise, most of them stated not to do it regularly.

**CONCLUSION:** The majority of the hypertensive patients had uncontrolled blood pressure and unhealthy lifestyle worsening the disease.

## Introduction

The WHO reported that in 2002, the prevalence of hypertension was 15–37% of the adult population worldwide. Half of the world's population above 60 years old was suffered from hypertension. The WHO data in September 2011 showed that hypertension was responsible for 8 million deaths per year worldwide and 1.5 million deaths per year in the Southeast Asia region [1]. Hypertension ranked the third most common disease at the outpatient clinics in Indonesia in 2004 and escalated to the second rank (4.67%) in 2006. Survey of the risk factors for cardiovascular disease showed that the prevalence of hypertension in Indonesia increased to 13.6% in men and 16% in women [2].

This study conducted at Primary Health Center (PHC) in Banyu Urip district, Surabaya, which represents the urban district in Indonesia. Availability of medical tools, medication, and human resource might be better than PHC in rural or in isolated areas of Indonesia. This

study describes the result of hypertension management in PHC level in Indonesia.

Hypertensive patients experience a disruption in productivity, such as inability to work (4%) and 28.2% sick leave over the past year [3]. The productivity level of hypertensive patients was strongly determined by doctor's performances in PHC and patients' compliance in managing the disease. Those two features together have an important role in preventing complications. This study aimed to analyze the profile and lifestyle of hypertensive patients and health services in primary health facilities as one of the catastrophic diseases in Indonesia.

## Methods

This study was conducted by observing hypertensive patients. The sample size was all

hypertensive patients who came for health examinations in the past 3 months at one of the PHC on Surabaya in 2018, comprising 104 patients. Variables measured in this study were respondent characteristics, diet pattern, physical activity, patient's socioeconomic conditions, genetic factors, pharmaceutical and non-pharmaceutical therapy from primary health services, controlled blood pressure status, hypertensive comorbidities, and hypertensive complications. Data were collected using primary (questionnaires as well as physical and laboratory examinations) and secondary data (medical records). This study received approval from the Ethics Committee, Faculty of Medicine, Universitas Airlangga, no. 167/EC/KEPK/FKUA/2018.

## Results

Table 1 showed that more than half of patients aged above 60 (57.7%). The majority of patients had a low educational background (66.3%). Most of the patients did not actively work due to retirement (8.6%) and be housewives (51%). The total family income per month was dominantly under USD 200 (73.1%).

**Table 1: Characteristics and profile of hypertensive patients**

Variables	Frequency (n)	Percentage
Sex		
Male	24	23.1
Female	80	76.9
Age		
18–39	3	2.9
40–59	41	39.4
≥60	60	57.7
Education		
No formal education	6	5.8
Elementary school	33	31.7
Junior high school	30	28.8
Senior high school	28	26.9
High education	7	6.7
Occupation		
Merchant	16	15.4
Housewives	53	51
Retired	9	8.6
Others	26	25
Income (USD/months)		
<200	76	73.1
200–400	21	20.2
>400	7	6.7
Degree of hypertension (early treatment)		
Hypertension degree 1	41	39.4
Hypertension degree 2	63	60.6
Degree of hypertension (during research)		
Controlled (normal and pre-hypertension)	32	30.7
Hypertension degree 1	54	51.9
Hypertension degree 2	16	15.4
Hypertension degree 3	2	1.9
Duration of hypertension (years)		
≤10	81	77.9
11–20	18	17.3
>20	5	4.8
Duration of hypertension treatment at the health center (years)		
≤5	86	82.7
6–10	11	10.6
>10	7	6.7
Medication regularity		
Highly regular	64	61.5
Less regular	27	26.0
Not regular	13	12.5

This study also showed that 69.2% of the patients did not achieve the target blood pressure. Most of them were in Stage 1 hypertension (51.9%). The majority were suffered from the disease for <10 years

(77.9%), but mostly they came to PHC in the past 5 years (82.7%). Most of the patients committed taking the medication regularly (61.5%).

Table 2 showed that the symptom that patient complained the most was tension-type headache (45.2%), while the less was vertigo (9.6%). Electrocardiogram in 27.9% was abnormal. Ischemia and infarction were found in 18 cases (17.3%). The abnormal condition that was an indication of hypertensive complications was dominated by ischemic and old myocardial infarction, which was found in 62.1% of patients with an abnormal ECG.

**Table 2: Profile of clinical symptoms of hypertension and ECG profile**

Symptoms	Frequency (n)	Percentage
Headache		
Often	32	30.8
Seldom	44	42.3
Never	28	26.9
Vertigo		
Often	10	9.6
Seldom	32	30.8
Never	62	59.6
Back neck pain		
Often	47	45.2
Seldom	30	28.8
Never	27	26.0
Normal ECG	75	72.1
Abnormal ECG	-	-
AF with rapid ventricular response	1	1.0
Complete RBBB	3	2.9
Incomplete RBBB	2	1.9
Anterior ischemia	2	1.9
Anterolateral ischemia	4	3.8
Anteroseptal ischemia	3	2.9
Left atrial abnormality	2	1.9
Occasional PVC, ischemia anterior	1	1.0
Anterior OMI	1	1.0
Anteroseptal OMI	2	1.9
Anteroseptal OMI	2	1.9
Inferior OMI	1	1.0
Inferior OMI	1	1.0
PAC	1	1.0
PVC, OMI anteroseptal	1	1.0
S persistent V1-V6	2	1.9

OMI: Old myocardial infarction, PVC: Premature ventricular complex, PAC: Premature atrial contraction, ECG: Electrocardiography.

Table 3 showed that most of the patients ate healthy food and never drank coffee or alcohol. The majority of them rarely eat vegetables/fruit and fatty foods. The majority of the hypertensive patients never exercised, but most claimed not to smoke. Most of the patients received education about a healthy diet, taking medication, and visiting PHC regularly from a doctor in PHC.

Table 4 showed that patients had a high level of total cholesterol and blood sugar, while their uric acid levels were normal, despite one patient with 9.00 mg/dL uric acid level. Normal total cholesterol levels were found in 49 patients (49.5%), while hypercholesterolemia was found in 50 patients (50.5%). Normal fasting blood sugar levels were found in 62 patients (61.4%), while 39 patients (38.6%) were suffered from diabetes. Normal uric acid levels were found in 89 patients (89.9%), while 10 patients were at high levels (10.1%).

Table 5 showed the effectiveness in therapy was dominated by combination therapy. The types of antihypertensive drugs taken were captopril, amlodipine, and others, given both in monotherapy and in combination, depending on the stage of hypertension.

**Table 3: History of consumed food, alcohol, smoking, habit, diet education, and exercise**

Consumption	Frequency (n)	Percentage
<b>Salty foods</b>		
Often	38	36.5
Seldom	48	46.2
Never	18	17.3
<b>Cow meat</b>		
Often	28	26.9
Seldom	21	20.2
Rarely	47	45.2
Never	8	7.7
<b>Goat meat</b>		
Often	3	2.9
Seldom	12	11.5
Rarely	35	33.7
Never	54	51.9
<b>Salted fish</b>		
Often	9	8.7
Seldom	19	18.3
Rarely	37	35.6
Never	39	37.5
<b>Canned meat/fish</b>		
Often	0	0
Seldom	14	13.5
Rarely	27	26.0
Never	63	60.5
<b>Vegetables</b>		
Often	75	72.1
Seldom	14	13.5
Rarely	11	10.6
Never	4	3.8
<b>Fresh fruit</b>		
Often	62	59.6
Seldom	17	16.3
Rarely	22	21.2
Never	3	2.9
<b>Fatty food</b>		
Often	46	44.2
Seldom	22	21.2
Rarely	33	31.7
Never	3	2.9
<b>Coffee</b>		
Often	21	20.2
Seldom	16	15.4
Rarely	25	24.0
Never	42	40.4
<b>Alcohol</b>		
Rarely	1	1.0
Never	103	99.0
<b>Smoking habit</b>		
Often	6	5.8
Seldom	2	1.9
Rarely	2	1.9
Never	94	90.4
<b>Exercise habit</b>		
Often	37	35.6
Seldom	10	9.6
Rarely	15	14.4
Never	42	40.4
<b>Obtaining education on foods prevented</b>		
Yes	79	76.6
No	24	23.3
<b>Education on medication taking</b>		
Often	85	81.7
Seldom	10	9.6
Rarely	3	2.9
Never	6	5.8
<b>Education on examination</b>		
Often	85	81.7
Seldom	11	10.6
Rarely	2	1.9
Never	6	5.8

**Table 4: Laboratory results**

Laboratory	Sample size	Minimum	Maximum	Mean	Standard deviation
Fasting blood glucose	101	68	439	139.71	68.764
Cholesterol	99	119	351	207.01	47.344
Uric acid	99	2.0	9.0	4.433	1.3748

higher among men up to middle-age in all ethnicity. After middle age, the prevalence of hypertension was higher in women [4]. A particular case in women often found white coat hypertension and very varied systolic blood pressure [5]. The fact that hypertension prevalence in this research was higher in women aged over 65 years old due to the longer life expectancy of women. Nearly 75% of post-menopausal women in America suffer from hypertension [6]. In this study, since there were more hypertensive patients in the age group of 60 years or more, the proportion of women was also higher. The educational background was dominated by junior high school or less. The majority of patients were housewives with monthly family income which was under USD 200.

**Table 5: Comparison between monotherapy and combination therapy in controlling hypertension**

Blood pressure	Therapy	Frequency (n)	Mean (mmHg) of the decrease on blood pressure
Systolic blood pressure*	Monotherapy	64	-17.80
	Combination	38	-26.32
Diastolic blood pressure**	Monotherapy	62	-5.95
	Combination	37	-10.41

\*Comparative study independent t-test,  $p=0.049$ . \*\*Comparative study Mann-Whitney test,  $p=0.066$ .

There were hypertension stage 1 and 2 at the beginning of diagnosed (obtained from the medical record), but a change happened during the study. Some of them increased to stage 3, but some became normal and decreased to pre-hypertensive (categorized as controlled conditions). That fact showed that not all of patients' blood pressure was regulated due to pathophysiological basis on age theory (the higher the age and the higher the risk of increasing blood pressure) even though the patient obtained sufficient therapy. Regulated blood pressure is determined by various factors, including the regularity of taking medication, diet patterns, exercise, stress levels, and others.

Early detection of hypertension in patients was found in several health examination centers, such as primary health centers, hospitals, and private clinics or during social services. Symptoms complained were not specific because the patients rarely complained headaches but, more often, only pain behind the neck so that because the complaint was not specific, the patient was less able to detect an increase in blood pressure.

## Discussion

### **Characteristics of the patients**

Hypertensive patients were dominated by the age of over 60 years. Age distribution in this research was similar to other research because of the pathophysiology of the disease, namely arterial stiffness has occurred in older age. Based on gender, the patients were dominated by women. Research conducted by August P. in 2013 showed that the prevalence of hypertension was

### **Overview of diet, exercise habits, and drinking coffee in hypertensive patients**

This study showed that hypertensive patients have a proper diet, for example, they rarely consumed salty food or salted fish and beef. Most of them informed us that they never ate goat meats, never drank coffee, alcohol, and often ate fresh vegetables and fruit. Even so, most patients still admitted consuming fatty

foods; thus, most of them claimed to be suffered from dyslipidemia. In addition to hypertension, abdominal adipose deposits also play a role in the pathogenesis of coronary heart disease, sleep apnoea, and cerebrovascular accidents [7], [8].

Results of laboratory tests showed that the average of total cholesterol and random blood sugar was high. Diabetes mellitus and dyslipidemia were diseases that commonly found in conjunction with hypertension. The National Health and Nutrition Examination Survey (NHANES III) showed that 64% of hypertensive patients being suffered from dyslipidemia, and conversely, 47% of patients with dyslipidemia also suffering from hypertension [9]. In addition to dyslipidemia, diabetes mellitus was a disease that coincides with hypertension. According to Ferrannini and Cushman (2012), the proportion of hypertension in the type 2 diabetes mellitus population was quite high [10].

Most hypertensive patients never exercised, but most claimed not to drink coffee. Unfortunately, both variables were not significant in affecting hypertension statistically in this study ( $p = 0.640$  and  $p = 0.730$ , respectively). The exercise was one of the factors that can affect hypertension because it increases physical activity (adequate physical activity), which in line with the guidelines to prevent hypertension [11]. Kim *et al.* (2010) showed that adults from Korea who exercise regularly have a slower progression from pre-hypertension to hypertension compared to people who do not do routinely exercise [12]. In this study, the diet pattern of hypertensive patients was good. The patients often ate fresh vegetables and fruits. Vegetables and fresh fruit are sources of polyphenols which are antioxidants and are needed to reduce the risk of cardiovascular disease and degenerative diseases [13]. Another good behavior we found was that hypertensive patients rarely ate meat and salty foods. A diet pattern that was still not obeyed by the patient was consuming fatty foods, even the health-care provider had told them to avoid.

Lifestyles need to be improved: Losing weight in obesity, reducing drinking alcohol, increasing aerobic physical activity, reducing salt intake, maintaining adequate potassium intake, maintaining adequate calcium and magnesium intake, stopping in smoking, and reducing intake of saturated fat and cholesterol [14]. Research held in Pekanbaru, Indonesia, showed that smoking behavior dominantly affects uncontrolled blood pressure in older adult hypertensive patients ( $p = 0.004$ , odds ratio: 5.2 95% confidence interval: 1.71–15.8) due to increase of blood pressure and heart rate during smoking [15].

### **Management of hypertensive patients (treatment, education, and support for hypertensive patients) in PHC**

Pharmacologic treatment of hypertension in PHC was done with limited types of anti-hypertensive

drugs, such as captopril, amlodipine, and others, either by monotherapy or combination, generally depending on the stage of hypertension and the availability of drugs. For patients with hypertension plus impaired heart function and congestive heart failure, usage of diuretics, angiotensin-converting-enzyme inhibitors, or a combination of both was the best choice [16]. If blood pressure was controlled in the early stage of the disease, it will result on the better prevention of cardiovascular complications. Thus, two-drug combination is recommended to be given at the first use of therapy, in addition, that the possible side effect of the maximum dose of monotherapy can be reduced [17]. Nevertheless, it is depended on the doctors who prescribe, but they were standardized by the Indonesian Ministry of Health using guidelines by JNC VIII.

Non-pharmacological treatment, such as education to prevent the complication must be done by any health-care provider in PHC. For example, the doctors or nurses reminded the patients to take medication regularly, to visit for examination, and to avoid foods that have a role as the risk of increasing high blood pressure. As with younger people, this non-pharmacological intervention must be started before using drugs [18]. Hence, the majority of hypertensive patients filled the questionnaires that they received education from the health-care provider in PHC in Surabaya, especially by the doctors. This means that one program for disease prevention with education has been well-provided.

## **Conclusion**

Regarding supportive examination for screening and the detection of risk factors and complications, most of the patients suggested the check for diabetes mellitus as well as dyslipidemia as a regular examination. However, the ECG examination rarely been done. This study showed that nearly one-third of the patients (27.9%) had ECG abnormalities, so it would come to be a suggestion to PHC to do ECG examination routinely in hypertensive patients.

## **References**

1. Ministry of Health. Riset Kesehatan Dasar/Basic Health Research. Jakarta: Ministry of Health; 2013. Available from: [http://labdata.litbang.kemkes.go.id/images/download/laporan/RKD/2013/Laporan\\_riskesdas\\_2013\\_final.pdf](http://labdata.litbang.kemkes.go.id/images/download/laporan/RKD/2013/Laporan_riskesdas_2013_final.pdf). [Last accessed on 2020 May 04].
2. Widyasari N. Relationship of respondent's characteristic with the risk of diabetes mellitus and dyslipidemia at tanah kalikedinding. *J Berk Epidemiol.* 2017;5:130-41. <https://doi.org/10.20473/jbe.v5i12017.130-141>



3. Krstović-Spremo V, Račić M, Joksimović BN, Joksimović VR. The effects of diabetes mellitus and hypertension on work productivity. *Acta Med Acad.* 2014;43(2):122-33. <https://doi.org/10.5644/ama2006-124.111>  
PMid:25529517
4. August P. Hypertension in women. *Adv Chronic Kidney Dis.* 2013;20(5):396-401.  
PMid:23978544
5. Kaplan NM. Review of hypertension in practice, Third Edition. *J Hum Hypertens.* 1999;13(9):647.  
PMid:10482977
6. Ong KL, Tso AW, Lam KS, Cheung BM. Gender difference in blood pressure control and cardiovascular risk factors in Americans with diagnosed hypertension. *Hypertension.* 2008;51(4):1142-8. <https://doi.org/10.1161/hypertensionaha.107.105205>  
PMid:18259031
7. Stritzke J, Markus MR, Duderstadt S, Lieb W, Luchner A, Döring A, et al. The aging process of the heart: Obesity is the main risk factor for left atrial enlargement during aging. The MONICA/KORA (monitoring of trends and determinations in cardiovascular disease/cooperative research in the region of Augsburg) Study. *J Am Coll Cardiol.* 2009;54(21):1982-9. <https://doi.org/10.1016/j.jacc.2009.07.034>  
PMid:19909880
8. Narkiewicz K. Obesity and hypertension-the issue is more complex than we thought. *Nephrol Dial Transplant.* 2006;21(2):264-7. <https://doi.org/10.1093/ndt/gfi290>  
PMid:16311261
9. Egan B, Li J, Qanungo S, Wolfman TE. Blood pressure and cholesterol control in hypertensive hypercholesterolemic patients: National health and nutrition examination surveys 1988-2010. *Circulation.* 2013;128(1):29-41. <https://doi.org/10.1161/circulationaha.112.000500>  
PMid:23817481
10. Ferrannini E, Cushman WC. Diabetes and hypertension: The bad companions. *Lancet.* 2012;380(9841):601-10. [https://doi.org/10.1016/s0140-6736\(12\)60987-8](https://doi.org/10.1016/s0140-6736(12)60987-8)  
PMid:22883509
11. Diaz KM, Shimbo D. Physical activity and the prevention of hypertension. *Curr Hypertens Rep.* 2013;15(6):659-68. <https://doi.org/10.1007/s11906-013-0386-8>  
PMid:24052212
12. Kim SJ, Lee J, Jee SH, Nam CM, Chun K, Park IS, et al. Cardiovascular risk factors for incident hypertension in the prehypertensive population. *Epidemiol Health.* 2010;32:e2010003. <https://doi.org/10.4178/epih/e2010003>  
PMid:21191456
13. Mohamed S. Functional foods against metabolic syndrome (obesity, diabetes, hypertension and dyslipidemia) and cardiovascular disease. *Trends Food Sci Technol.* 2014;35(2):114-128. <https://doi.org/10.1016/j.tifs.2013.11.001>
14. Kotchen TA, McCarron DA. Dietary electrolytes and blood pressure. *Circulation.* 1998;98(6):613-7.
15. Mitra M, Wulandari W. Factors affecting uncontrolled blood pressure among elderly hypertensive patients in Pekanbaru city, Indonesia. *Open Access Maced J Med Sci.* 2019;7(7):1209-13. <https://doi.org/10.3889/oamjms.2019.255>  
PMid:31049109
16. Bulpitt CJ, Fletcher AE, Thijs L, Staessen JA, Antikainen R, Davidson C, et al. Symptoms reported by elderly patients with isolated systolic hypertension: Baseline data from the SYST-EUR trial. *Systolic hypertension in Europe. Age Ageing.* 1999;28(1):15-22. <https://doi.org/10.1093/ageing/28.1.15>  
PMid:10203199
17. Mancia G, Rea F, Corrao G, Grassi G. Two-drug combinations as first-step antihypertensive treatment. *Circ Res.* 2019;124(7):1113-23. <https://doi.org/10.1161/circresaha.118.313294>  
PMid:30920930
18. Bulpitt CJ, Rajkumar C, Cameron JD. Vascular compliance as a measure of biological age. *J Am Geriatr Soc.* 1999;47(6):657-63.  
PMid:10366163