Hypertension among Elderly in Indonesia: Analysis of the 2018 Indonesia Basic Health Survey

Rukmini Rukmini[1], Agung Dwi Laksono[2], Lulut Kusumawati[1], Khrisma Wijayanti[1]

[1] Researcher, Functional Unit of Health Technology Innovation, Ministry of Health, Jakarta. Indonesia,

[2]Researcher, Center of Research and Development of Humanities and Health Management, Ministry of Health, Jakarta, Indonesia

Abstract

The study aims to analyze descriptive statistics of theprevalence of hypertension amongthe elderly in Indonesia.The data derived from the 2018 Indonesia Basic Health Survey. The analysis was performed statistically descriptive. The analysis was carried out with a sample of 58,666elderly.The results show that the prevalence of hypertension based on doctor's diagnosis was 32.6%, the highest in the age group ≥80 years (37.4%), higher in women (36.9%), and the richestelderly (34.4%).The prevalence of hypertension among elderly people in Indonesia who are currently taking antihypertension drugs was 89.2%, tends to be higher in urban (89.6%) and women (89.4%), better education (92.3%), the richest (90.7%).The proportion of routinely taking hypertension medication in the elderly population with hypertension in Indonesia was 58.9% routine, 30.3% non-routine, and 10.1% not taking medication.The highest proportion of elderly with hypertension who regularly took medication was in the 60-69 age group (59.1%), lived in urban (62.8%), and male (59.1%). It was concluded that the hypertension prevalence among elderly people in Indonesia was dominated by the ≥80 age group and the female elderly.More than half of the elderly adhere to taking hypertension medication routinely according to doctor's instructions, the highest in the 60-69 age group, and more among male elderly.The prevalence of hypertension tends to be higher among the elderly who live in urban and increases with the better of education and better wealth status.

Keywords: *hypertension, elderly, big data, community health, public health.*

Background

In five decades, the percentage of elderly people in Indonesia has approximately doubled to 8.97% (23.4 million). Female elderly (9.47%) were more numerous than male elderly (8.48%)[1]. The number of elderly people continues to increase every year, in 2019 amounting to 9.7 million people, in 2025 it is predicted to increase by 12.54 million people[2]. In line with the increase in life expectancy, the health problems faced are increasingly complex. With the increase in the number of elderly people, the tendency for degenerative diseases is increasing, including hypertension[3,4].

Corresponding Author:
Agung Dwi Laksono
Email: agung.dwi.laksono-2016@fkm.unair.ac.id

Hypertension is a serious medical condition that significantly increases the risk of heart, brain, kidney, and other diseases, which are the leading cause of premature death worldwide. An estimated 1.13 billion people worldwide suffer from hypertension, two-thirds of whom live in low- and middle-income countries. In 2015, 1 in 4 men and 1 in 5 women developed hypertension. Less than 1 in 5 people with hypertension have the problem under control. The global target for non-communicable diseases is to reduce the prevalence of hypertension by 25% by 2025[5].

Over the past 10 years (2000-2010), the prevalence of hypertension fell by 2.6% in high-income countries but increased by 7.7% in low- and middle-income countries. In high-income countries, awareness, therapy, and control of hypertension have increased compared to low and middle-income countries. This condition shows

an increasing disparity of global hypertension[6].

The 2018 Indonesia Basic Health Survey uses a definition of hypertension based on the Joint National Committee (JNC) 7 criteria, namely if systolic blood pressure 140 mmHg or diastolic blood pressure 90 mmHg[7]. Based on the JNC 8 guideline, there was a change in the target systolic blood pressure in patients aged≥60, namely systolic 150 mm and diastolic 90 mmHg compared to the target systolic 140 mmHg and diastolic 90 mmHg in the previous guideline. This is an important point because in the management of hypertension in a patient population aged≥60, it is difficult to reach the systolic target of 140 mmHg as recommended by the JNC 7 guideline. This difficulty is not only experienced by doctors in Indonesia but also in other countries. The method of measuring blood pressure and the criteria used will determine the diagnosis of hypertension[8].

Hypertension complications can affect various target organs such as the heart, brain, kidney, eyes, peripheral arteries. The organ damage depends on the patient's high blood pressure and how long it has been uncontrolled and untreated for the high blood pressure[8].Age-related changes in the cardiovascular system influence the development of hypertension and heart failure in the elderly. Based on the background description, this study aims to analyze descriptive statistics of the prevalence of hypertension among the elderly in Indonesia.

Materials and Methods

The study employed the 2018 Indonesia Basic Health Surveydata. The 2018 Indonesia Basic Health Surveywas a national-scale survey conducted by the Indonesian Ministry of Health. Population in this study was the elderly in Indonesia (≥60 y.o.). With the multi-stage cluster random sampling method, it was a weighted sample of 58,666elderly.

The determination of hypertension based on the measurement results follows the guideline JNC 7 criteria, namely if the systolic was ≥140 mmHg and or diastolic ≥90 mmHg[7]. In this study, the hypertension prevalence consists of hypertension according to the doctor's diagnosis or was currently taking antihypertension drugs. The analysis was carried out by statistical descriptive by observing the distribution by province and demographic characteristics elderly. The demographic characteristics of the elderly were age group, type of place of residence, gender, education level, work type, and wealth status.

Results and Discussion

Table 1 presents the proportion of hypertension prevalence among the elderly by demographic characteristics. Table 1 describes the hypertension prevalence among elderly in Indonesia, which is dominant in the≥80 age group (37.4%), female (36.9%), and the richest (34.4%).

Table1. The prevalence of hypertension among the elderly by demographic characteristics (n=58,666)

Demographic Characteristics	hypertension diagnosis by a doctor		
	%	95% CI	N (Adjusted)
Age			
· 60-69	30.7	30.1-31.5	37,773
· 70-79	35.5	34.4-36.6	16,267
· ≥80	37.4	35.4-39.4	4,626
Place of residence			
· Urban	35.2	34.3-36.1	31,608
· Rural	29.6	28.9-30.3	27,058

Cont... **Table1. The prevalence of hypertension among the elderly by demographic characteristics (n=58,666)**

Gender			
· Male	27.1	26.3-27.9	25,739
· Female	36.9	36.2-37.7	32,927
Education			
· No education	33.7	32.4-35.0	11,091
· Didn't graduate from elementary school	32.0	30.9-33.1	15,770
· Elementary school	32.4	31.4-33.5	18,179
· Junior high school	33.8	31.9-35.8	4,854
· Senior high school	31.9	30.1-33.7	5,896
· College	32.4	30.0-35.0	2,877
Occupation			
· Not works	39.1	38.3-40.0	27,922
· Public servant/army/police	30.6	26.2-35.4	792
· Private sector	21.5	17.5-26.0	808
· Entrepreneur	28.9	27.2-30.7	6,114
· Farmer	24.0	23.1-24.9	15,833
· Fisherman	21.4	15.9-28.1	249
· Labor/Driver/Maid	26.2	23.7-28.8	2,940
· Others	34.5	32.4-36.7	3,801
Wealth			
· Poorest	31.5	30.3-32.8	11,995
· Poorer	31.4	30.0-32.7	11,042
· Middle	32.4	31.1-33.7	10,788
· Richer	32.9	31.6-34.2	11,140
· Richest	34.4	33.2-35.6	13,702

Source: The Riskesdas 2018

This finding is in line with previous research which states that daily diet, adipose activity, and psychosocial stress can cause higher blood pressure with age and an increase in income. Epidemiological surveys show a progressive increase in blood pressure with increasing age. The incidence of hypertension is higher in women after menopause because of the decrease in the hormone estradiol which has a protective effect on the structure, tone of blood vessels, and vasodilation of the endothelium of blood vessels, thereby inhibiting damage to blood vessels[9]. Previous studies have found that older females suffer from hypertension than males and the degree of hypertension in a female is heavier than in male[10].

The prevalence of hypertension based on the doctor's diagnosis in Indonesia tends to be higher in urban areas than in rural areas. In contrast to the findings of this study, studies in Africa inform that a higher prevalence of hypertension occurs in rural areas. This is due to lifestyle changes such as lack of physical activity and dietary modifications[11].

The prevalence of hypertension is relatively equal at all levels of education. Meanwhile, the unemployed group showed the highest prevalence of hypertension compared to other occupational groups.

Table 2. The proportion of hypertension basedontaking antihypertension drugs amongthe elderly in Indonesia (n=58,666).

Demographic Characteristics	Hypertension based on taking antihypertension drugs		
	%	95% CI	n (Adjusted)
Age			
· 60-69	89.4	88.5-90.2	11,408
· 70-79	89.6	88.3-90.7	5,678
· ≥80	86.9	83.8-89.5	1,699
Place of Residence			
· Urban	89.6	88.6-90.5	10,921
· Rural	88.7	87.8-89.6	7,864
Gender			
· Male	88.9	87.8-89.9	6,840
· Female	89.4	88.5-90.2	11,945
Education			
· No education	88.3	86.5-89.9	3,668
· Didn't graduate from elementary school	89.3	88.0-90.5	4,954
· Elementary school	88.3	87.0-89.5	5,791
· Junior high school	89.8	87.5-91.8	1,611
· Senior high school	91.6	89.5-93.3	1,845
· College	92.3	89.5-94.4	917
Occupation			
· Not works	89.2	88.2-90.1	10,736
· Public servant/army/police	96.6	93.4-98.3	238

Cont... **Table 2. The proportion of hypertension basedontaking antihypertension drugs amongthe elderly in Indonesia (n=58,666).**

·	Private sector	90.8	84.2-94.8	170
·	Entrepreneur	88.7	86.2-90.8	1,734
·	Farmer	88.4	87.0-89.7	3,733
·	Fisherman	72.8	51.9-86.9	52
·	Labor/Driver/Maid	90.5	87.1-93.1	756
·	Others	90.5	87.9-92.6	1,288
Wealth				
·	Poorest	88.1	86.6-89.5	3,717
·	Poorer	88.9	87.3-90.3	3,401
·	Middle	88.9	87.0-90.5	3,433
·	Richer	89.2	87.6-90.5	3,600
·	Richest	90.7	89.3-91.9	4,634

Source: The Riskesdas 2018

Table 2 illustrates the prevalence of hypertension according to a doctor's diagnosis or currently taking antihypertensive drugs based on demographic characteristics. The prevalence of hypertension among elderly people in Indonesia who are currently taking antihypertensive drugs is 89.2%. The data shows that most hypertension sufferers who have been diagnosed by a doctor have already undergone therapy. Based on the characteristics, the prevalence of hypertension while taking medication is relatively the same in all age groups and tends to be higher in urban areas (89.6%). Femaleelderly tend to be higher (89.4%) than male elderly (88.9%). Previous research has informed that there is a gender relationship with the quality of life of elderly people with hypertension, namely that male is 3.33 times more likely to experience a poor quality of life[12].

The prevalence of hypertension based on taking medication tends to be higher in the elderly with better education levels and wealth status. With a better education level, the elderly have knowledge and understanding of the importance of drug therapy for hypertension. Better wealth status also makes it easier for hypertensive elderly people to buy and take hypertension medication. Previous studies stated that knowledge of hypertension affects attitudes towards preventing complications of hypertension[13].Based on occupation type, public servants are the group with the highest prevalence of hypertension based on taking medication.

Compliance with taking antihypertensive drugs regularly are respondents who are diagnosed with hypertension by a doctor, who take antihypertensive drugs routinely according to doctor's instructions, or take anti-hypertensive drugs every day (self-initiative)[7]. Previous research found that there was a significant relationship between gender, length of suffering from hypertension, history of other diseases, and regularity of taking medication with the quality of life of the elderly participating in chronic disease control programs at the Public Health Center[12].

Table 3 shows the proportion of routinely taking hypertension medication among the elderly in Indonesia. It was informed that 58.9% were routine, 30.3% not routine, and 10.1% did not take medication. These data indicate that only a portion of the elderly is obedient to taking hypertension medication regularly. In addition to the diagnostic and therapeutic management of hypertension, it is very important in the clinical

evaluation of hypertensive patients to ensure treatment adherence and optimize the therapeutic scheme and routine blood pressure monitoring[14].

The highest proportion of elderly with hypertension who regularly took medication was in the 60-69 age group (59.1%), lived in urban (62.8%), and male (59.1%). The proportion of routinely taking hypertension medication among the elderly in Indonesia increases along with the higher education level and better wealth status. Elderly groups with public servant/army/police jobs show the highest proportion of routinely taking hypertension medication. Better education levels are often associated with better output in health[15,16]. Meanwhile, poor education is informed as a barrier to achieving good performance in the health sector[17,18].

Previous research states that male elderly have a higher level of medication adherence than female. Based on education level, higher education level has lower adherence to taking medication than low education level[19].The elderly who have a high level of education certainly have knowledge and understanding of the illness they are suffering from. Previous study found that there was a relationship between knowledge and motivation of patients with adherence to taking antihypertensive drugs[20].Meanwhile, another study states that the factor affecting the level of compliance of hypertensive patients is monthly income. Income will affect a person's lifestyle. High incomes will tend to be more consumptive because they can buy things that are needed[21].

Table 3. The proportion of routine taking antihypertensive drugs in the elderly in Indonesia (n=58,666).

Demographic Characteristics	Taking of antihypertensive drugs						N (adjusted)
	Routine		Not routine		Not taking		
	%	95% CI	%	95 % CI	%	95 % CI	
Age							
60-69	59.1	57.8-60.5	30.2	29.0-31.5	10.6	9.8-11.5	11,408
70-79	58.9	56.9-60.9	30.7	28.9-32.6	10.4	9.3-11.7	5,678
≥80	57.5	54.0-61.0	29.4	26.5-32.5	13.1	10.5-16.2	1,699
Place of residence							
Urban	62.8	61.3-64.3	26.8	25.4-28.2	10.4	9.5-11.4	6,627,600
Rural	53.5	52.1-54.9	35.2	33.9-36.5	11.3	10.4-12.2	4,075,064
Gender							
Male	59.1	57.3-60.8	29.9	28.3-31.5	11.1	10.1-12.2	6,840
Female	58.8	57.5-60.2	30.6	29.3-31.8	10.6	9.8-11.5	11,945

Cont... **Table 3. The proportion of routine taking antihypertensive drugs in the elderly in Indonesia (n=58,666).**

Education							
No education	55.4	52.9-57.8	32.9	30.7-35.2	11.7	10.1-13.5	3,668
Didn't graduate from elementary school	56.2	54.1-58.3	33.1	31.2-35.1	10.7	9.5-12.0	4,954
Elementary school	57.4	55.5-59.3	30.9	29.2-32.8	11.7	10.5-13.0	5,791
Junior high school	62.7	59.0-66.2	27.2	23.9-30.7	10.2	8.2-12.5	1,611
Senior high school	68.9	65.6-72.1	22.7	19.9-25.7	8.4	6.7-10.5	1,845
College	70.8	66.4-74.8	21.5	17.9-25.6	7.7	5.6-10.5	917
Occupation							
Not works	60.5	59.1-62.0	28.7	27.4-30.0	10.8	9.9-11.8	10,736
Public servant/ army/police	72.9	64.6-79.8	23.7	17.2-31.8	3.4	1.7-6.6	238
Private sector	63.8	52.4-73.8	27.0	17.9-38.7	9.2	5.2-15.8	170
Entrepreneur	60.6	57.1-63.9	28.1	25.1-31.4	11.3	9.2-13.8	1,734
Farmer	50.8	48.6-53.0	37.6	35.4-39.8	11.6	10.3-13.0	3,733
Fisherman	46.0	30.7-62.2	26.7	16.0-41.2	27.2	13.1-48.1	52
Labor/Driver/ Maid	61.1	55.5-66.5	29.4	24.6-34.7	9.5	6.9-12.9	756
Others	62.1	58.2-65.8	28.4	25.1-32.0	9.5	7.4-12.1	1,288
Wealth status							
Poorest	54.0	51.7-56.3	34.1	31.9-36.4	11.9	10.5-13.4	3,717
Poorer	55.6	53.0-58.2	33.3	30.8-35.8	11.1	9.7-12.7	3,401
Middle	57.5	54.9-60.0	31.4	29.1-33.8	11.1	9.5-13.0	3,433
Richer	58.6	56.1-60.9	30.6	28.4-32.9	10.8	9.5-12.4	3,600
Richest	66.6	64.6-68.6	24.0	22.3-25.9	9.3	8.1-10.7	4,634

Source: the Riskesdas 2018

Conclusions

The prevalence of hypertension among the elderly in Indonesia tends to increase with age, was higher for women, lives in urban areas, and tends to get higher with increasing education levels and wealth status. Based on the routine taking medication, more than half of the elderly who adhere to taking hypertension medication routinely according to doctor's instructions, the highest in the 60-69 age group, live in urban, male, and increase with higher education levels and better wealth status.

Acknowledgments: The author would like to thank the National Institute Research and Development, the MOH of the Republic of Indonesia, who has agreed to allow the Riskesdas 2018 data to be analyzed in this article.

Source of Funding: Self-funding

Ethical Clearance: The research had an ethical clearance that was approved by the national ethical committee (ethic number: LB.02.01/2/KE.378/2019). Informed consent was used during data collection, which considered aspects of the data collection procedure, voluntary, and confidentiality.

Conflict of Interest: The authors declare no conflict of interest, financial or otherwise.

References

1. Indonesian Central Bureau of Statistics. Indonesian Elderly Population Statistics 2018. Jakarta; 2018.
2. Indonesian Central Bureau of Statistics. Indonesian Elderly Population Statistics 2019. Badan Pusat Statistik. Jakarta; 2019.
3. Suiroaka IP. Prevent, Recognize and Reduce 9 Risk Factors 9 Degerative Diseases. Jojakarta: Nuh Medika; 2012. 1–180 p.
4. Laksono AD, Nantabah ZK, Wulandari RD. Barriers to Health Center Access for the Elderly in Indonesia. Bull Heal Syst Res. 2018;21(4):228–235.
5. World Health Organization. Hypertension. Fact sheets. 2019;(September).
6. Mills KT, Bundy JD, Kelly TN, Reed JE, Kearney PM, Reynolds K, et al. Global disparities of hypertension prevalence and control. Circulation. 2016;134(6):441–50.
7. National Institute of Health Research and Development of The Indonesia Ministry of Health. The 2018 Indonesia Basic Health Survey (Riskesdas): National Report [Internet]. Jakarta; 2019. Available from: http://labmandat.litbang.depkes.go.id/images/ download/ laporan/ RKD/2018/ Laporan% 7B%5C_%7D Nasional%7B%5C_%7DRKD2018%7B%5C_%7DFINAL.pdf
8. Muhadi. Evidence-based Guideline for Management of Adult Hypertensive Patients. Cermin Dunia Kedokt. 2016;43(1):54–9.
9. Gurven M, Blackwell AD, Rodríguez DE, Stieglitz J, Kaplan H. Does blood pressure inevitably rise with age?: Longitudinal evidence among forager-horticulturalists. Hypertension. 2012;
10. Kusumawaty J, Hidayat N, Ginanjar E. Relationship between Gender and Hypertension Intensity in the Elderly in the Working Area of Puskesmas Lakbok, Ciamis Regency. J Mutiara Med. 2016;16(2):46–51.
11. Bâ HO, Camara Y, Menta I, Sangaré I, Sidibé N, Diall IB, et al. Hypertension and Associated Factors in Rural and Urban Areas Mali: Data from the STEP 2013 Survey. Int J Hypertens. 2018;(article ID 6959165):7.
12. Chendra R, Misnaniarti, Zulkarnain M. Quality of Life of the Elderly Participants of Prolanis of Patients with Hypertension in the Work Area of the Kenten Laut Community Health Center. J JUMANTIK. 2020;5(2 Juni):126–37.
13. Mujiran, Setiyawan, Shovie NR. Relationship of Knowledge Level about Hypertension UPT Jenawi Karanganyar Health Center. J Ilm Kesehat dan Apl. 2019;7(2):34–41.
14. Oliveras A, De La Sierra A. Resistant hypertension: Patient characteristics, risk factors, co-morbidities and outcomes. J Hum Hypertens. 2014;28(4):213–7.
15. Kusrini I, Fuada N, Supadmi S, Laksono AD. Education as Predictor of Low Birth Weight among Female Worker in Indonesia. Medico-Legal Updat. 2021;21(1):360–5.
16. Laksono AD, Wulandari RD, Kusrini I, Ibad M. The effects of mother's education on achieving exclusive breastfeeding in Indonesia. BMC Public Health. 2021;21(1):14.
17. Laksono AD, Wulandari RD. The Barrier to

Maternity Care in Rural Indonesia. J Public Heal From Theory to Pract. 2020;Online First.

18. Rohmah N, Yusuf A, Hargono R, Laksono AD, Masruroh, Ibrahim I, et al. Determinants of teenage pregnancy in Indonesia. Indian J Forensic Med Toxicol. 2020;14(3):2080–5.
19. Hazwan A. Description of the Characteristics of Patients with Hypertension and the Level of Compliance with Taking Medicines in the Working Area of Kintamani I Health Center. Intisari Sains Medis. 2017;
20. Hanum S, Puetri NR, Marlinda M, Yasir Y. Relationship between Knowledge, Motivation, and Family Support with Compliance with Medication in Patients with Hypertension at Peukan Bada Community Health Center, Aceh Besar District. J Kesehat Terpadu (Integrated Heal Journal). 2019;10(1):30–5.
21. Utomo PT. The Relationship between Knowledge Levels about Hypertension and Hypertension Recurrence Prevention Efforts in the Elderly in Blulukan Village, Colomadu District, Karanganyar Regency. Surakarta: Faculty of Health Science, Universitas Muhammadiyah Surakarta; 2013. p. 1–18.
22. Hull TH, Hull VJ. The Persistence of High Fertility. In: Caldwell JC, editor. Canberra: Department of Demography, Australian National University; 1977.