



## Research article

# Hypertension treatment in rural Indonesia during the COVID-19 pandemic: An analysis

Magdarita Riwu\*, Kartini Lidia, Prisca Pakan

Faculty of Medicine and Veterinary Medicine, Universitas Nusa Cendana, Kupang, Indonesia

**Corresponding author:** Magdarita Riwu ✉ [magdarita\\_riwu@staf.undana.ac.id](mailto:magdarita_riwu@staf.undana.ac.id), **Orcid Id:** <https://orcid.org/0000-0001-7351-8247>

Department of Pharmacology, Faculty of Medicine and Veterinary Medicine, Universitas Nusa Cendana, Kupang, Indonesia

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**Received - 17-08-2023, Revised - 24-08-2023, Accepted - 28-08-2023 (DD-MM-YYYY)**

## Refer This Article

Magdarita Riwu, Kartini Lidia, Prisca Pakan, 2023. Hypertension treatment in rural Indonesia during the COVID-19 pandemic: An analysis. Journal of medical pharmaceutical and allied sciences, V 12 - I 4, Pages - 6021 – 6024. Doi: <https://doi.org/10.55522/jmpas.V12I4.5563>.

## ABSTRACT

People with chronic diseases are at higher risk of a pandemic threat because COVID-19 can affect their clinical outcomes, including mental illness and cardiovascular disease. COVID-19 has reduced access to healthcare facilities and physicians for patients with chronic diseases who require regular visits, follow-ups, testing and prescription refills. The aim of this study is to analyse the effectiveness of hypertension therapy based on the patient's blood pressure level at each visit. This is a descriptive-analytical study that uses a cross-sectional approach and retrospective data. Data collection started in April and ended in October 2021. Data were collected from the medical records of the Oesapa Health Centre in Kupang City to conduct the research. 165 respondents participated in the study. The results of the study of patients with hypertension in the area of research data showed non-compliance in carrying out health control or treatment, namely 229 respondents (83.27%), then two visits by 28 respondents (10.18%), three visits by 13 respondents (4.73%), four visits with 3 respondents (1.10%), five and ten visits for health check-ups, each with only one respondent (0.36%). The results of this study suggest that the pandemic state of COVID-19 has a significant impact on patients' compliance with their health check-ups and on their treatment outcomes.

**Keywords:** Hypertension, Pandemic, Therapy, COVID-19.

## INTRODUCTION

COVID-19 originated in Wuhan, China, and along with increasing human-to-human spread, the World Health Organization (WHO) announced a pandemic on 11 March 2020. Corona Virus-19 disease caused by Severe Acute Respiratory Syndrome Corona Virus-2 (SARS) CoV-2 by the World Health Organization (WHO) on 11 March 2020 was declared a pandemic and became a global challenge<sup>[1]</sup>. The SARS-CoV-2 virus uses the Angiotensin-Converting Enzyme-2 (ACE2) receptor to enter cells, similar to SARS-CoV<sup>[2]</sup>. The risk of COVID-19 is higher in elderly patients, especially men, with a

history of diabetes and hypertension treated with ACE-inhibitors (ACE-i) and angiotensin receptor blockers (ARBs) because these drugs increase ACE-2 receptor expression<sup>[2]</sup>.

Chronic diseases pose a challenge to all health systems and are increasing with age and become a burden on health care, and the prevalence of chronic conditions is increasing in many countries. Treatment difficulties and uncertainty about the endpoint of the COVID-19 pandemic have led to the emergence of mental health problems, such as panic, anxiety, and depression<sup>[3]</sup>.

Other problems that arise due to COVID-19 include the nonadherence of chronic disease sufferers in treatment, which triggers somatic symptoms and exacerbations of general pathologies<sup>[4]</sup>. The COVID-19 pandemic has dramatically changed human life, which has never happened before, regardless of skin color<sup>[5]</sup>. Ethnicity and wealth affect biological treatment globally. Based on the results of the study by Wu and McGoogan, (2020) of 72,314 cases in China, the case fatality ratio (CFR) was 10.5% for patients with cardiovascular disease, 7.3% for diabetes,

6.3% for the chronic respiratory syndrome, and 6% for hypertension, while the CFR in the general population is 2.3 %<sup>[6]</sup>.

Patients with chronic diseases are at a higher risk of a pandemic threat because COVID-19 can affect the clinical outcomes of patients with chronic conditions such as mental illness and cardiovascular disease, whose development and management are linked to stress and anxiety. A major problem for patients with chronic diseases who are chronically ill. Require regular visits, follow-ups, examinations, and the filling of prescriptions due to the COVID-19 pandemic causing access to health facilities and treating doctors to decline due to the possibility of infection in hospitals/healthcare facilities forcing most patients to avoid health facilities to consult a doctor<sup>[7]</sup>.

The prevalence of hypertension in Indonesia obtained through measurements at the age of 18 years is 25.8%, the prevalence obtained through a questionnaire is diagnosed by health workers by 9.4%, diagnosed by health workers or currently taking medication is 9.5%. (12) The prevalence of hypertension interviewed throughout the Province of East Nusa Tenggara (NTT) was 7.2%, and the prevalence of all hypertension taking medication in NTT was 7.4%. (13) The estimated prevalence was significantly higher in the elderly (> 65 years) compared with young adults (<65 years) overall and across geographic areas<sup>[8]</sup>.

The problems of chronic disease patients include high medical costs and low quality of life due to patient non-adherence to therapy<sup>[9]</sup>. Intentional and unintentional medication non-adherence indicates a common and persistent health problem, including clinical and economic problems and estimates of non-adherence to long-term therapy 50% length for chronic disease<sup>[10]</sup>.

Based on the description above, we intend to analyze the success of therapy and the cost-effectiveness of chronic disease patients so that it can be seen the influence/impact of the Covid-19 pandemic on the treatment process for hypertensive patients, obtain data on the condition and attitude of hypertensive patients in responding to pandemic conditions and can provide useful input in the process of treating hypertension patients to improve the patient's health status.

## MATERIALS AND METHODS

The subject of the study was a population of outpatient hypertension patients who underwent antihypertensive treatment at several health centers in Kupang City during the Covid-19 pandemic, namely from March 2020 to December 2020, both men and women in the adult category of 165 respondents. This research is included in descriptive-analytic research with a cross-sectional approach with retrospective data. Retrospective data collection started from April to October 2021. The research was conducted by collecting data from the medical records of the Oesapa Health Center in Kupang City.

The study was carried out after obtaining approval from the Kupang City Health Office Number: DINKES.440.870/1023/IX/2021, date: 10 September 2021. The time of the study was from April 2021 to

October 2021. Retrospective data collection of respondents who met the research criteria at the Poly Internal Diseases in register documents and media records in coordination with Puskesmas officers in charge of non-communicable disease (hypertension) services.

Descriptive statistical analysis was used to see the characteristics of the subjects and research variables during the Covid-19 pandemic. Variables with numerical data scales include age described by means and standard deviations, while categorical-scale variables are described by number and percent. The results of this descriptive statistical analysis are displayed in a cross-distribution table.

## RESULTS AND DISCUSSION

### Demographic Distribution of Research Respondents

The demographic characteristics of the research respondents (Table 1) show that the proportion of male sex is 98 people (35.64%) less than female 177 people (64.36%). The age criteria of the observed respondents were adults aged 18-65. The selection of this age range was based on the consideration that the onset of hypertension often occurs from 18 years.

**Table 1:** Demographic Distribution of Respondents with Hypertension by Age Range and Gender

| Age (years)  | Male      |              | Female     |              | Total(n=275) |            |
|--------------|-----------|--------------|------------|--------------|--------------|------------|
|              | n         | %            | n          | %            | n            | %          |
| 18-27        | 11        | 4.00         | 4          | 1.45         | 15           | 5.45       |
| 28-37        | 8         | 2.91         | 14         | 5.09         | 22           | 8.00       |
| 38-47        | 12        | 4.37         | 39         | 14.18        | 51           | 18.55      |
| 48-57        | 31        | 11.27        | 78         | 28.37        | 109          | 39.64      |
| 58-65        | 36        | 13.09        | 42         | 15.27        | 78           | 28.36      |
| <b>Total</b> | <b>98</b> | <b>35.64</b> | <b>177</b> | <b>64.36</b> | <b>275</b>   | <b>100</b> |

### Distribution of Respondents' Visits in 10 Months of Observation

The results of the study of patients with hypertension in the range of research data in Table 2, showed non-compliance in carrying out health control or treatment, namely 229 people (83.27%), then two visits by 28 people (10.18%), three visits by 13 people (4.73%), four visits with 3 people (1.10%), five and ten visits for health check-ups, each with only one person (0.36%).

The age criteria of observed respondents were adults aged 18–65. The selection of this age range was based on the consideration that the onset of hypertension often occurs from 18 years. 57 years (109/275) followed by 58 – 65 years (78/275). Many research has stated that hypertension increases with age and tends to be higher in women than men. Indeed, the age-related prevalence of increased blood pressure was higher in women than in men. This condition may be related to BMI, and the percentage of fat in women was higher than in men<sup>[11,12]</sup>.

Risk factors for hypertension include age, gender, BMI, physical activity, smoking, and alcohol<sup>[13]</sup>. The results of this study showed that hypertension increased with age was 19.5% among those aged <30 years, 37.8% at 30 - 49 years, and 30.1% among 50 years, as well as related to the gender of the results of this study which prevalence of hypertension is higher in women (8.2%) than men (7.7%) and also states that gender, age, overweight/obesity are the main factors associated with hypertension.

**Table 2.** Distribution of Respondents' Visits in 10 Months of Observation

| Number of visits | Respondents |       | Mean Blood pressure (mmHg) |         |         |      |     |               |       |       |      |     |
|------------------|-------------|-------|----------------------------|---------|---------|------|-----|---------------|-------|-------|------|-----|
|                  |             |       | Systolic (n)               |         |         |      |     | Dyastolic (n) |       |       |      |     |
|                  | n           | %     | <120                       | 120-139 | 140-159 | ≥160 | Sum | <80           | 80-90 | 90-99 | ≥100 | Sum |
| 1                | 229         | 83.27 | 1                          | 8       | 96      | 124  | 229 | 10            | 27    | 68    | 124  | 229 |
| 2                | 28          | 10.18 | 1                          | 2       | 13      | 12   | 28  | 4             | 4     | 6     | 14   | 28  |
| 3                | 23          | 4.73  | 0                          | 3       | 3       | 7    | 13  | 0             | 5     | 4     | 4    | 13  |
| 4                | 3           | 1.10  | 0                          | 2       | 0       | 1    | 3   | 0             | 1     | 2     | 0    | 3   |
| 5                | 1           | 0.36  | 0                          | 0       | 1       | 0    | 1   | 0             | 0     | 1     | 0    | 1   |
| 10               | 1           | 0.36  | 0                          | 0       | 1       | 0    | 1   | 0             | 1     | 0     | 0    | 1   |
| Total            | 275         | 100   | 2                          | 15      | 114     | 114  | 275 | 14            | 38    | 81    | 142  | 275 |

Therefore, it can be said that that older age, overweight, and obesity have a higher risk of hypertension<sup>[13]</sup>. Studies have shown that most hypertensive patients were women, and the mean age was 58 (SD  $\pm$  12.1) years. In the other hand, some studies also reveal men to have a higher prevalence of hypertension (30.6%) compared to women (13.8%), indicating male sex is associated with smoking and a non-vegetarian diet that has an association with hypertension<sup>[14,15,16]</sup>.

Some research has demonstrated that among 418 participants classified as hypertensive, more than a third (39.0%) were not aware that they had hypertension. Hypertension is also a disease that is often asymptomatic (the silent killer) which causes sufferers to be disobedient in using drugs. Treatment is carried out if there are complaints that interfere with activities. The body has an adjustment system to increase blood pressure so that it does not cause significant symptoms. After several years, untreated high blood pressure will impact organ function disorders, leading to complex treatment and complaints in the sufferer<sup>[17,18]</sup>.

Table 2 shows that many people with hypertension do not routinely carry out health checks during the Covid-19 pandemic. In Table 2, most patients who do not routinely carry out health checks have relatively high blood pressure, and uncontrolled or no change for better improvement. This shows that the Covid-19 pandemic condition greatly affects the level of patient compliance in carrying out their health checks and impacts the success rate of patient treatment.

The data also shows that most patients are hypertensive in grades 1 and 2, which means that if it is associated with the nature of hypertension, it is a silent killer, and if the patient's condition is left untreated, it will harm the health in the future, such as increasing patients with uncontrolled blood pressure: controlled, the incidence of complications and increased health costs.

The results of this study allow the need for an active role for health workers in educating and communicating with patients. Studies confirmed that shared decision-making and proactive communication directly affected hypertension control. Improved patient medication adherence was associated with patient-centered care, patient/provider communication, and patient education<sup>[19]</sup>.

The research results by Riwu et al. 2019 shows that counseling in the counseling group positively influences patient compliance with health control and taking medication. The patient's

non-compliance in carrying out health control and taking antihypertensive drugs can ultimately affect uncontrolled blood pressure. If left unchecked can harm complications and increase healthcare costs. Research by Riwu et al. (2019) stated that the improvement in compliance was due to interventions in the form of pharmacist counseling which influenced and provided the respondent's understanding of their illness, complications, antihypertensive drugs, and possible side effects, lifestyle, and physical activity. Providing pharmacist counseling effectively improves patient compliance. Counseling provides pharmacist education to patients, including information on health management (blood pressure) to prevent complications<sup>[19]</sup>.

From the results of this study, what is feared is that non-compliance with health controls can worsen health and cause complications. Where research by Riwu et al. 2019 shows that every year increase in someone diagnosed with hypertension reduces the success rate of therapy by 23.9%, plus if it is associated with the nature of hypertension itself, which is a chronic disease, most of which are asymptomatic and are referred to as silent killers. Due to its asymptomatic nature, which ultimately causes the burden of disease and is one of the most significant risk factors for morbidity and mortality<sup>[20]</sup>.

## CONCLUSION

Health problems related to hypertension will persist or increase in the aging population. With increasing age, blood pressure (systolic and diastolic) increases. The increasing prevalence of hypertension is caused by population growth, aging, and behavioral risk factors, such as unhealthy diet, harmful use of alcohol, lack of physical activity, excess body weight, and constant exposure to stress. The risk of hypertension increases with age due to the hardening of the arteries. Hardening of the arteries is the most important pathophysiological determinant of isolated systolic hypertension and an age-dependent increase in pulse pressure. This hardening of the arteries can be slowed through healthy living, including healthy eating, and reducing dietary salt intake.

## ACKNOWLEDGEMENT

The authors are grateful to this study was fully funded and supported by Universitas Nusa Cendana, Indonesia.

## CONFLICT OF INTEREST

There is no conflict of interest in this study.

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