

Article

# Evaluation of Drug Related Problems of Antihypertensive Drugs in Inpatient Hypertensive Patients at the Latemmamala Regional General Hospital, Soppeng Regency for the January-March 2023 Period

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## Abstract

Hypertension is an increase in systolic blood pressure of more than 140 mmHg and diastolic blood pressure of more than 90 mmHg in two measurements taken five minutes apart at rest. Problems caused by drug abuse are called DRPs (Drug Related Problems). The occurrence of DRPs is known to have a detrimental effect on patient quality of life, increased mortality and high medical costs. This study aims to determine the incidence of DRPs and the types of DRPs that occur in hypertensive patients at Latemmamala Hospital, Soppeng Regency. This study is a type of non-experimental descriptive research conducted retrospectively using secondary data in medical records where samples were selected using purposive sampling technique. The results showed that of the 78 samples consisting of 42 women (53.85%) and 36 men (46.15%), all of which met the inclusion and exclusion criteria, showed that the age prevalence was more prone to hypertension at the age of 56-75 years as many as 47 patients (60.26%). There were 46 cases out of 43 patients who had the potential to experience DRPs. The most DRPs that occurred were in the case of C1.4 as many as 26 cases (56.52%), then C1.1 as many as 20 cases (43.48%).

**Keywords:** Hypertension, Hospitalization, Evaluation of Drug Related Problems, RSUD Latemmamala

## 1. INTRODUCTION

Hypertension or high blood pressure is an increase in systolic blood pressure of more than 140 mmHg and diastolic blood pressure of more than 90 mmHg in two measurements taken five minutes apart in a state of sufficient rest/rest [1]. Hypertension is a cardiovascular disease with systolic blood pressure values  $>140$  mmHg and diastolic blood pressure  $>90$  mmHg. Hypertension is influenced by several factors including: age, genetics, gender and lifestyle [2].

The World Health Organization (WHO) states that hypertension, or high blood pressure, is a serious medical condition that significantly increases the risk of heart, brain, kidney, and other diseases [3]. Hypertension is a leading cause of premature death worldwide, with approximately 1.56 billion adults living with hypertension in 2020. Hypertension causes nearly 8 billion deaths per year worldwide, and nearly 1.5 million deaths per year in the South Asia region [4]. In Indonesia, the prevalence of hypertension in the population aged  $\geq 18$  years is 34.1% and 25.8%, with an increase of about 9.7% in 5 years. According to the profile of the provincial health office, hypertension or hypertension in South Sulawesi with the highest cases, namely in Selayar district 32.49%, Soppeng district 24.92% and Takalar 14.82%. Soppeng Regency has 13,435 hypertension patients in 2016 while in 2017 there were 5,194 cases and in 2018 there were 4,997 cases of hypertension. Based on data from the Soppeng Regency Health Office regarding the 10 highest diseases where hypertension occupies as the most common disease, then there is dyspepsia and ISPA. Data shows that out of 225,512 residents of Soppeng Regency, the number of hypertension sufferers was 22,236 (9%) people in 2015, 31,486 (13%) people in 2016 and increased in 2018 by 34,380 (20%) [5].

Drug Related Problems (DRPs) are events or circumstances related to drug therapy, both actual and potential, that may interfere with and affect the desired therapeutic outcome. Drug Related Problems (DRPs) are an event that is not expected from the patient's experience or is suspected to be the result of drug therapy, such that it has the potential to interfere with the desired success of the cure. The occurrence of DRPs may prevent or delay the patient from achieving the desired therapy [6]. Drug-related problems (DRPs) are very common in inpatients. DRPs can lead to a decrease in patients' quality of life, an increase in the length of hospital stay, an increase in treatment costs, and even an increase in the risk of morbidity and mortality [7]. Financial hardship has a significant impact on patients' quality of life. In France and Germany, independent bodies assess the co-benefits of a drug and price negotiations are based on this benefit assessment. In Switzerland, the Federal Office of Public Health (FOPH) considers the drug's co-benefits and external prices in reference countries (e.g., Germany and France) when negotiating drug prices [8].

Most patients with hypertension require two or more antihypertensive drugs to achieve their desired blood pressure targets. The addition of a second drug from a different class begins when the use of a single drug at a common dose fails to achieve the target blood pressure. The use of more than one type of medication leaves hypertensive patients vulnerable to drug-related problems, known as drug-related problems (DRPs) [9].

A study in Indonesia on DRP analysis in cases of uncomplicated hypertension at Tangerang Regency General Hospital found that 28.77% of cases experienced DRP [10]. In a case study of drug-related problems in hypertensive patients at the Temindung Samarinda Health Center, the incidence of drug interactions was 7.5%, adverse drug reactions were 37.5%, and patient non-compliance was 37.5% [11]. According to a study on the identification of drug-related problems in outpatients at Klaten Hospital in 2010, it was shown that of the 110 patients who met the inclusion criteria, 6.36% showed cases of inaccurate drug selection, 1.82% of the dose was underdosed, there were no cases of overdose, and 16.36% of the cases were drug interactions [12].

Drug-induced mortality and morbidity is a very important issue, because among 26,462 medical patients, it was found that 0.9% of 1000 people died because of drugs. This data was obtained from a review of the Bosston Collaborative Drug Surveillance Program (BCDSP) [13]. As the number of patients with hypertension increases, the use of

antihypertensive drugs in combination is also increasing. Thus, the potential for problems related to the use of drugs for patients is significant [14].

Based on the high prevalence of hypertension in South Sulawesi, the magnitude of DRPs in hypertension cases that occur and the importance of identifying DRPs in hypertensive patients. Therefore, a study was conducted on the evaluation of drug-related problems (DRPs) in inpatient hypertension patients at Latemmamala Regional General Hospital, Soppeng Regency for the period January-March 2023.

2. METHODS

The population used in the study were all patients with a diagnosis of hypertension who underwent hospitalization at Latemmamala General Hospital, Soppeng Regency, South Sulawesi in the period January-March 2023. This study uses secondary data from medical records and has received ethical approval by the Health Research Ethics Commission of the Muslim University of Indonesia with ethical license number 262/A.1/KEP-UMI/VII/2024. The sampling technique used was purposive sampling. The number of samples obtained from calculations using the slovin formula is 78 samples. The inclusion criteria: data on patients diagnosed with hypertension, data on patients receiving hypertension therapy, data on inpatients in the January-March 2023 period, data on hypertensive patients aged > 18 years. The inclusion criteria in this study were incomplete medical record data and pregnant patient data.

3. RESULT AND DISCUSSION

This study used medical record data for inpatients with hypertension with or without comorbidities at the Latemmamala Regional General Hospital, Soppeng Regency, January-March 2023, there were 78 medical record samples.

3.1 Patient Characteristics Based on Gender

Based on table 1. Characteristics of patients based on gender of 78 patients sampled and found that patients with female gender were more dominant at 42 patients (53.84%) and men at 36 patients (46.15%).

Table 1. Patient Characteristics Based on Gender

| No.   | Gender | Case | percentage (%) |
|-------|--------|------|----------------|
| 1.    | Male   | 36   | 46.15          |
| 2.    | Female | 42   | 53.85          |
| Total |        | 78   | 100            |

The percentage of female patients suffering from hypertension is higher than that of men. This is in line with the research of Wahyuni & Eksanoto (2019) [15], women tend to suffer from hypertension than men. In this study, 27.5% of women experienced hypertension, while for men it was only 5.8%. The same thing was also stated by Tuloli, et al (2021) [6] that the distribution of patients based on gender at the Inpatient Installation of Multazam Hospital, Gorontalo City, January-December 2018, the results showed that patients with female gender were 34 patients or 57.63% more than male patients as many as 25 patients or 42.37%. Women who have not yet menopausal are protected by the hormone estrogen which plays a role in increasing High Density Lipoprotein (HDL) levels. Low HDL cholesterol levels and high LDL (Low Density Lipoprotein) cholesterol affect the occurrence of the atherosclerosis process and result in high blood pressure [16]. Based on the observations of Sukmawati, et al (2016) [17] from the data of elderly patients (60 years and over) who underwent treatment for hypertension as many as 50 hypertensive patients, where 64% of female patients suffered from hypertension while male patients were only 36%. This is because elderly women

(60 years and older) have experienced menopause, at which time there is an increase in the production of estrogen hormone, which is one of the risk factors for the onset of hypertension.

### 3.2 Patient Characteristics Based on Age

Based on table 2. Characteristics of patients based on age, from a total of 78 samples of medical record data found patients who have various ages. The most common age range is patients aged 56-75 years as many as 47 patients (60.26%) and the lowest is patients who have an age range of 18-30 as many as 1 patient (1.28%).

Table 2. Patient Characteristics Based on Age

| No    | Age   | Case | Percentage (%) |
|-------|-------|------|----------------|
| 1.    | 18-30 | 1    | 1.28           |
| 2.    | 31-55 | 22   | 28.21          |
| 3.    | 56-75 | 47   | 60.26          |
| 4.    | >76   | 8    | 10.25          |
| Total |       | 78   | 100            |

The most common age range found was patients aged 56-75 years as many as 47 patients (60.26%). The results of this study are in line with Ekaningtyas (2021) [18], which shows that hypertensive patients with an age group of 51-60 years have the highest frequency, namely 19 respondents (48.7%). Age is one of the risk factors that cannot be modified, as age increases, the higher the risk of developing hypertension. This is due to structural changes in large blood vessels so that the lumen becomes narrow and causes the walls of the blood vessels to become stiff, this forces blood to pass through narrow blood vessels, triggering an increase in blood pressure [19].

### 3.3 Classification of Hypertension

In accordance with research conducted by (Haerani, 2021) [20], it shows that the highest percentage of hypertension classification obtained is stage 2 hypertension  $\geq 160/\geq 100$  mmHg as many as 65 patients (67.7%) of the total sample of 96 patients. Where it requires combination therapy to lower blood pressure. Based on this, the selection of therapy use is based on the patient's age, because generally the increase in blood pressure is slowly influenced by increasing age. Based on the hypertension treatment algorithm from JNC VIII that in addition to pharmacological therapy, hypertension treatment also needs to be given non-pharmacological therapy such as lifestyle modification. In accordance with research conducted by.

Table 3. Classification of Hypertension

| No    | Classification of Hypertension | Case | Percentage (%) |
|-------|--------------------------------|------|----------------|
| 1.    | Normal                         | 0    | 0              |
| 2.    | Prehypertensive                | 0    | 0              |
| 3.    | Hypertensive Stage 1           | 32   | 41.03          |
| 4.    | Hypertensive Stage 2           | 46   | 58.97          |
| Total |                                | 78   | 100            |

### 3.4 Treatment Classification

Drug classification is known from 78 patient samples, the most common type of treatment given is single drug or monotherapy as many as 47 patients (60.26%), then a combination of 2 drugs as many as 21 patients (26.92%), a combination of 3 drugs as many as 9 patients, and a combination of 4 drugs as many as 1 patient (1.28%).

Table 4. Classification of antihypertensive treatment

| No    | Treatment Classification | Case | Percentage (%) |
|-------|--------------------------|------|----------------|
| 1.    | Monotherapy              | 47   | 60.26          |
| 2.    | 2 Combinations           | 21   | 26.92          |
| 3.    | 3 Combinations           | 9    | 11.54          |
| 4.    | 4 Combinations           | 1    | 1.28           |
| Total |                          | 78   | 100            |

According to (Indonesian Society of Hypertension Physicians) 2021 [21] that the therapeutic recommendations for stage 2 hypertension use combination therapy. From the results of this study, it is known that the number of stage 2 hypertension cases is greater than stage 1 hypertension cases so that the use of combination therapy should be used more than single therapy or monotherapy. According to JNC VIII in 2014, the use of monotherapy is given to patients who do not have a history of comorbidities and are encouraged to continue to adopt a healthy lifestyle [20].

### 3.5 Drug Classes and Types

Based on the data as can be seen in Table 5, the most commonly used class of drugs is CCB class drugs, which are known to work to reduce blood pressure through peripheral vasodilation and stimulants through increased renin activity and angiotensin II production, which can activate the Sympathetic Nervous System (SNS). This has an effect on lowering blood pressure from the use of CCB class drugs [20]. Based on research conducted by (Oktianti, et al, 2020) [22], it shows that the most widely used antihypertensive is Calcium Channel Blocker (CCB) as much as 53.13% followed by Angiotensin Receptor Blocker (ARB) at 46.87%.

Table 5. Classes and types of antihypertensive drugs in the inpatient installation of Latemmamala Hospital, Soppeng Regency

| No    | Drug Group                                                                     | Type of Medicine                               | Case | Percentage (%) |
|-------|--------------------------------------------------------------------------------|------------------------------------------------|------|----------------|
| 1.    | CCB                                                                            | Amlodipine                                     | 38   | 48.05          |
| 2.    | ARB                                                                            | Candesartan                                    | 7    | 9.09           |
| 3.    | $\beta$ Blocker                                                                | Bisoprolol                                     | 1    | 1.30           |
| 4.    | CCB and ARB                                                                    | Amlodipine and Candesartan                     | 13   | 16.88          |
| 5.    | CCB and Diuretic Loop                                                          | Amlodipine and Furosemide                      | 1    | 1.30           |
| 6.    | CCB and ACEI                                                                   | Amlodipine and Ramipril                        | 6    | 9.09           |
|       |                                                                                | Amlodipine and Lisinopril                      | 1    |                |
| 7.    | Central $\alpha_2$ Agonist and Loop Diuretic                                   | Clonidine and Furosemide                       | 1    | 1.30           |
| 8.    | CCB, ARB and Loop Diuretic                                                     | Amlodipine, Candesartan and Furosemide         | 2    | 2.60           |
| 9.    | CCB, ARB and Central $\alpha_2$ Agonist                                        | Amlodipine, Candesartan and Clonidine          | 1    | 1.30           |
| 10.   | CCB, ARB and $\beta$ Blocker                                                   | Amlodipine, Candesartan and Bisoprolol         | 1    | 1.30           |
| 11.   | CCB, $\beta$ Blocker and Central $\alpha_2$ Agonist                            | Amlodipine, Bisoprolol and Clonidine           | 1    | 1.30           |
| 12.   | CCB, Loop diuretic and Central $\alpha_2$ Agonist                              | Amlodipine, Furosemide and clonidine           | 2    | 2.60           |
| 13.   | CCB, Diuretic and $\beta$ Blocker                                              | Amlodipine, Furosemide and Bisoprolol          | 1    | 1.30           |
| 14.   | Central $\alpha_2$ Agonist, Diuretic Antagonist Aldosteron and $\beta$ Blocker | Clonidine, Spironolactone and Bisoprolol       | 1    | 1.30           |
| 15.   | CCB, Loop Diuretic, ACEI and Central $\alpha_2$ Agonist                        | Amlodipine, Furosemide, Ramipril and Clonidine | 1    | 1.30           |
| Total |                                                                                |                                                | 78   | 100            |

The second most prescribed antihypertensive drug group was a combination of CCBs and ARBs. Angiotensin Receptor Blockers have the same pharmacologic effects as ACE Inhibitors which cause vasodilation and block aldosterone secretion, but because they do not affect bradykinin metabolism, they are reported to have no side effects of dry cough and angiodema as often occurs with ACE inhibitors. So that the combination of CCBs and ARBs has a synergistic effect that will accelerate blood pressure reduction in geriatric hypertensive patients, reduce morbidity and mortality due to complicated diseases and as a car-dioprotective during blood pressure regulation [22]. The same results are also in line with research conducted by (Oktianti, et al, 2020) [23] which shows that of the 47 patients who used combination therapy, the most widely used combination was a combination of CCB and ARB groups of 61.70% with amlodipine and candesartan drugs with a percentage of 31.91%. The use of combination therapy can produce a fairly maximum decrease in blood pressure when compared to the use of a single drug, but again with the different conditions of each patient [23].

Amlodipine is widely used as therapy because this drug from the CCB class is included in the first line of therapy and has been recommended as initiation and maintenance therapy for the treatment of hypertension either used as monotherapy or combination therapy. Amlodipine is also known to be safe to be used together with other drugs including hypertensive patients who have comorbidities. Amlodipine has vasculoselective properties, has high bioavailability, wide distribution volume, long elimination half-life, namely the concentration of amlodipine in plasma decreases with a half-life of 35 hours, and slow absorption. Amlodipine is also very useful for treating hypertension in an emergency because the initial dose is 10 mg, and can reduce blood pressure within 10 minutes [24]. Amlodipine is a drug from the third generation dihydropyridine (DHP) category of CCBs which has a mechanism of action that inhibits calcium from entering vascular smooth muscle cells and myocardial cells resulting in a decrease in peripheral vascular resistance which can increase the depolarization time found in cardiac smooth muscle which becomes longer. There will be a decrease in blood pressure when amlodipine binds to  $\alpha_1$  receptors and inhibits L-type calcium channels. The daily dose of amlodipine used is 5 mg per day with a maximum dose of 10 mg per day. Side effects that are often caused by the use of amlodipine are peripheral edema with a percentage of 2-5% [2].

### 3.6 Results of DRPs Event Identification

There were 46 cases of DRPs (Table 6) that occurred in hypertension patients at Latemmamala Hospital, Soppeng Regency. Where for the incidence of DRPs that occurred the most, namely in the case of C1.4 Innapropriate combination of drugs, or drugs and herbal medications, or drugs and dietary supplements as many as 26 cases (56,52%), then category C1.1 Innapropriate drug according to guidelines/formulary as many as 20 cases (43,48%).

Table 6. Results of DRPs Event Identification

| No.   | Problem                                                                                                     | Code V9.00 | Number of Cases | Percentage (%) |
|-------|-------------------------------------------------------------------------------------------------------------|------------|-----------------|----------------|
| 1.    | Untreated symptoms or indication                                                                            | P1.3       | 0               | 0.00           |
| 2.    | Innapropriate drug according to guidelines/<br>formulary                                                    | C1.1       | 20              | 43.48          |
| 3.    | No indications for drug                                                                                     | C1.3       | 0               | 0.00           |
| 4.    | Innapropriate combination of drugs, or drugs<br>and herbal medications, or drugs and dietary<br>supplements | C1.4       | 26              | 56.52          |
| 5.    | Drug dose too low                                                                                           | C3.1       | 0               | 0.00           |
| 6.    | Drug dose too high                                                                                          | C3.2       | 0               | 0.00           |
| Total |                                                                                                             |            | 46              | 100            |

In category C1.4 Innapropriate combination of drugs, or drugs and herbal medications, or drugs and dietary supplements were found to have potential drug interactions. Drug interactions are DRPs events that have an influence on the body's response to the treatment process. Drug interactions are seen from the severity level where there are three categories including major, moderate and minor severity. Major severity has the potential for serious effects on patients that can cause damage to certain organs and even death. Moderate severity has the potential to have a moderate effect, with organ damage to the body requiring additional therapy. Minor severity has the potential for lighter effects that can be treated immediately and as well as possible [25].

In this study, there were 26 cases (54.17%) of potential drug interactions with drugs, based on severity there were 23 cases with moderate severity where the most interaction was between amlodipine - diclofenac sodium. The use of NSAIDs (NonSteroid Anti-Inflammatory Drugs) together with CCBs can increase the risk of acute renal failure and an increase in blood pressure. These results are in accordance with research conducted by (Khusna & Murdiana, 2021) [20]. NSAID-group drugs work by inhibiting renal prostaglandin synthesis, causing salt and water retention. This can increase blood pressure and affect the effectiveness of antihypertensive drug therapy. Although the risk of NSAIDs and CCB class drugs may be less than other antihypertensive drugs, it is still recommended to be careful in their use (Khusna & Murdiana, 2021) [20]. There were 3 cases of interaction with major severity, namely the use of amlodipine-simvastatin, the interaction that occurs when using the two drugs together is rhabdomyolysis which involves damage to skeletal muscle tissue. Major interactions are potentially life-threatening so the combination should be avoided [26].

Table 7. Potential drug-drug interactions by severity

| Severity Level | Name of medicine |                   | Total      |                |
|----------------|------------------|-------------------|------------|----------------|
|                | Drug 1           | Drug 2            | Total Case | Percentage (%) |
| Mayor          | Amlodipine       | Simvastatine      | 3          | 11.54          |
| Moderate       | Amlodipine       | Diclofenac sodium | 7          | 26.92          |
|                | Amlodipine       | Atorvastatine     | 5          | 19.23          |
|                | Amlodipine       | Clobazam          | 4          | 15.38          |
|                | Candesartan      | Diclofenac sodium | 2          | 7.69           |
|                | Cefixime         | Furosemide        | 1          | 3.85           |
|                | Lansoprazole     | Furosemide        | 1          | 3.85           |
|                | Clonidine        | Bisoprolol        | 1          | 3.85           |
|                | Codein           | Amlodipine        | 1          | 3.85           |
|                | Furosemide       | Diclofenac sodium | 1          | 3.85           |
|                | Total            |                   | 26         | 100            |

The second DRPs event was in Category C1.1 Innapropriate drug according to guidelines/formulary as many as 20 cases (41.67%). The incompatibility of the drugs given with the formulary is due to the use of drugs that are not in accordance with the type of hypertension. In this study, most patients had a diagnosis of stage 2 hypertension and were only given one type of hypertension drug class, namely drugs from the CCB group. In the algorithm compiled by PERKI 2015 and PERHI 2021 which refers to the American Society of Hypertension (ASH) and the International Society of Hypertension (ISH) Global Hy-pertension Practice Guidelines, that hypertension therapy for the treatment of stage 2 hypertension with blood pressure  $\geq 160$  /  $\geq 100$  mmHg is given a combination of drugs from the CCB or diuretic group and ACEi or ARB. Research conducted by (Khusna & Murdiana, 2021) [20] shows that for stage 2 hypertension it is recommended to use combination therapy. The combination therapies used include CCB + Diuretics and CCB + ACEi. The CCB + Diuretic combination is the most widely used combination where CCB class drugs work through peripheral vasodilation by lowering blood pressure, while diuretic class drugs work by inhibiting

sodium reabsorption in the distal tubules as well as a direct vasodilating effect on arterioles which can increase excretion through urine. In addition, the CCB+ACEi combination also triggers a reduction in left ventricular mass and has a renal protective effect. The combination of CCB+ACEi/ARB is also known to be more beneficial because it has lower results in the presence of adverse side effects [20].

### 3.7 Analysis of the Relationship Between Age and the Incidence of DRPs

Based on table 8. It can be seen that the effect between age groups on the incidence of DRPs using the Chi Square analysis test obtained results for the significance of the relationship, namely  $0.139 > 0.05$ , which means that there is no significant relationship between the age variable and the incidence of DRPs.

Table 8. The results of the analysis of the relationship between age and the incidence of DRPs

|                              | Chi-Square Tests |    |                                   |
|------------------------------|------------------|----|-----------------------------------|
|                              | Value            | df | Asymptotic Significance (2-sided) |
| Pearson Chi-Square           | 5.488a           | 3  | 0.139                             |
| Likelihood Ratio             | 5.978            | 3  | 0.113                             |
| Linear-by-Linear Association | 5.296            | 1  | 0.021                             |
| N of Valid Cases             | 78               |    |                                   |

a. 4 cells (50.0%) have expected count less than 5. The minimum expected count is 47.

### 3.8 Analysis of the Relationship Between Gender and Incidence

Based on table 9. It can be seen that the effect between gender groups on the incidence of DRPs using the Chi Square analysis test obtained results for the significance of the relationship which is  $0.675 > 0.05$ , which means that there is no significant relationship between gender variables on the incidence of DRPs

Table 9. Results of the analysis of the relationship between gender and incidence

|                                    | Chi-Square Tests |    |                                   |
|------------------------------------|------------------|----|-----------------------------------|
|                                    | Value            | df | Asymptotic Significance (2-sided) |
| Pearson Chi-Square                 | 0.176a           | 1  | 0.675                             |
| Continuity Correction <sup>b</sup> | 0.037            | 1  | 0.847                             |
| Likelihood Ratio                   | 0.176            | 1  | 0.675                             |
| Fisher's Exact Test                |                  |    |                                   |
| Linear-by-Linear Association       | 0.174            | 1  | 0.677                             |
| N of Valid Cases                   | 78               |    |                                   |

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 17.08.

b. Computed only for a 2x2 table

## 4. CONCLUSION

1. Patient characteristics based on gender for 78 patients sampled and it was found that patients with female gender were more dominant by 42 patients (53.84%) and male by 36 patients (46.15%). The characteristics of patients based on age were most commonly found were 47 patients aged 56-75 years (60.26%) and the lowest patient had an age range of 18-30 as many as 1 patient (1.28%).
2. The most frequent occurrence of DRPs was in C1.4 with 26 cases (56.52%), followed by C1.1 with 20 cases (43.48%).
3. The influence between age groups on the incidence of DRPs was obtained with the results of the significance of the relationship, which was  $0.139 > 0.05$ , which means that there was no significant relationship between

the age variables on the incidence of DRPs. The influence between gender groups on the incidence of DRPs was obtained with the results of the significance of the relationship, which was  $0.675 > 0.05$ , which means that there was no significant relationship between the gender variables on the incidence of DRPs.

## REFERENCES

1. Amalia, V.N., Sjarqiah, U. Gambaran Karakteristik Hipertensi Pada Pasien Lansia di Rumah Sakit Islam Jakarta Sukapura Tahun 2020. *Muhammadiyah Journal of Geriatric* 2023, 3(2), 62-68.
2. Puspitasari, C.E., Widiyastuti, R., Dewi, N.M.A.R., Woro, O.Q.L., Syamsun, A. Profil Drug Related Problems (DRPs) pada Pasien Hipertensi di Instalasi Rawat Jalan Rumah Sakit Pemerintah di Kota Mataram Tahun 2018. *Jurnal Sains Dan Kesehatan* 2022, 4(SE-1), 66-77.
3. Wulandari, A., Sari, S.A., Ludiana. Penerapan Relaksasi Benson Terhadap Tekanan Darah Pada Pasien Hipertensi Di Rsud Jendral Ahmad Yani Kota Metro Tahun 2022. *Jurnal Cendikia Muda* 2023, 3(2), 163-171
4. Chaniago, Y., Ardini, D. Studi Deskriptif Pemberian Obat Pasien Hipertensi Di Puskesmas Tanjungsari Kecamatan Natar Kabupaten Lampung Selatan. *Jurnal Analis Kesehatan* 2019, 8(1), 22-26.
5. Munafilah, S.S., Puspitasari, A., Bur, N. Faktor Yang Mempengaruhi Kejadian Hipertensi Di Wilayah Kerja Puskesmas Cakkarudi. *Window of Public Health Journal* 2022, 3(5), 848-859
6. Tuloli, T.S., Pakaya, M.S. Identifikasi Drug Related Problems (DRPs) Pasien Hipertensi di RS Multazam Kota Gorontalo. *Indonesian Journal of Pharmaceutical Education* 2021, 1(1), 1-9.
7. Adiana, S., Maulina, D. Klasifikasi Permasalahan Terkait Obat (Drug Related Problem/DRPs): Review. *Indonesian Journal of Health* 2022, 2(2), 54-58.
8. Yuliana, D., Widowati, F.D., Fawwaz, M. Analisis Farmakoekonomi Terhadap Regimen Kemoterapi Pasien Kanker Payudara Di Rumah Sakit Universitas Hasanuddin Makassar. *Media Farmasi* 2024, 20(1), 71-83.
9. Supraptia B., Nilamsari W.P., Hapsari P.P., Muzayana H.A., Firdausi H. Permasalahan Terkait Obat Antihipertensi pada Pasien Usia Lanjut di Poli Geriatri RSUD Dr. Soetomo Surabaya, *Jurnal Farmasi dan Ilmu Kefarmasian Indonesia* 2014, 1 (2), 36-41.
10. Nur'aini., Wiedaty, I., Lestari, A.D. Analisis Drug Related Problems (DRPs) Pada Kasus Hipertensi tanpa Komplikasi Terhadap Pasien Rawat Jalan di Rumah Sakit Umum Kabupaten tangerang. *Jurnal Farmagazine* 2014, 1(2), 22- 28
11. Handayani, D.S., Rolan, R., Ibrahim, A. Analisis Karakteristik dan Kejadian Drug Related Problems pada Pasien Hipertensi di Puskesmas Temindung Samarinda. *Jurnal Sains dan Kesehatan* 2015, 1(2), p. 75-81.
12. Nisa, K. *Identifikasi Drug Related Problems (DRPs) pada Pasien Hipertensi Rawat Jalan di Rumah Sakit Islam Klaten Tahun 2010*, Skripsi, Universitas Muhammadiyah Surakarta 2012.
13. Cipolle, J.R., Strand, L., Morley, C.P. *Pharmaceutical Care Practice the Clinician's Guide*. Edisi ke 2. New York-Toronto: McGraw-Hill 2008, 178-179
14. Tjay T.H., Rahardja, K. *Obat-Obat Penting Khasiat, Penggunaan dan Efek-Efek Sampingnya*, PT Elex Media Komputindo, Jakarta 2015.
15. Wahyuni, Eksanoto, D. Hubungan Tingkat Pendidikan dan Jenis Kelamin dengan kejadian Hipertensi di kelurahan Jagalan di Wilayah Kerja Puskesmas Pucangsawit Surakarta. *Journal of Chemical Information and Modeling* 2019, 53(9), 1689-1699.
16. Ghosh, S., Mukhopadhyay, S., Barik, A. Sex differences in the risk profile of hypertension: A cross-sectional study. *BMJ Open* 2016, 6(7), 1-8
17. Sukmawati, S., Kosman, R., Damayanti, I. Identifikasi Penggunaan Obat Pada Pasien Hipertensi Usia Lanjut Dengan Beer's Criteria Di Instalasi Rawat Inap Rumah Sakit Ibnu Sina Makassar Periode Tahun 2012. *As-Syifaa Jurnal Farmasi* 2016, 8(1), 52-58.
18. Ekaningtyas, A., Wiyono, W., Mpila, D. Evaluasi Penggunaan Obat Antihipertensi Pada Pasien Hipertensi Di Puskesmas Kolongan Kabupaten Minahasa Utara. *Jurnal Pharmacon* 2021, 5: 570-576.
19. Khusna, N., Murdiana, E. Identifikasi Drug Related Problems (DRPs) Obat Antihipertensi Pada Pasien Hipertensi Di Puskesmas Dharma Rini Temanggung. *Jurnal Farmasi Dan Kesehatan Indonesia* 2021, 1(2), 13-26.

20. Haerani, N. *Evaluasi Rasionalitas Penggunaan Obat Antihipertensi Pada Pasien Hipertensi Di Instalasi Rawat Jalan Rumah Sakit Hikmah Kota Makassar*. Makassar: Skripsi. UIN Alauddin Makassar 2021.
21. Perhimpunan Dokter Hipertensi Indonesia (PERHI). *Konsensus Penatalaksanaan Hipertensi 2019*. Indonesian Society Hipertensi Indonesia 2019.
22. Sargowo H.D. *Single Pill Combination in Antihypertensive Therapy*. Fakultas Kedokteran Universitas Brawijaya. Malang 2012.
23. Oktianti, D., Furdianti, N.H., Fajriani, W.N., Ambarsari, U. Evaluasi terapi antihipertensi pada pasien rawat Inap di RS X di Semarang. *Indonesian Journal of Pharmacy and Natural Product* 2020, 3(1), 25-35.
24. Dagmar, Z.N., Lestari, D., Rahayu, A.P., Syaputri, F.N., Asmara, T.D. Evaluasi profil penggunaan obat antihipertensi pada pasien hipertensi di salah satu klinik kota Bandung. *Journal of Science, Thecnology, and Entrepreneurship* 2021, 3(1):16–24
25. Setyoningsih, H., Zaini, F. Hubungan Interaksi Obat Terhadap Efektivitas Obat Antihipertensi Di RSUD Dr. R. Soetrasno Rembang. *Cendekia Journal of Pharmacy* 2022, 6(1), 76-88.
26. Lusi, I., Oktaviani. E. *Kajian Antihipertensi Pada Pasien Rawat Inap di Salah Satu Rumah Sakit di Bogor, Indonesia*. Universitas Pakuan Bogor 2019.