

SUITABILITY OF PRESCRIPTION WRITING WITH HOSPITAL FORMULARY IN HEART DISEASE PATIENTS AT CITRA HUSADA HOSPITAL

Della Utami Inayaturrehman^{1*}, Sutrisno², Sholihatil Hidayati³

¹Bachelor of Pharmacy, Faculty of Health Sciences, Universitas dr. Soebandi, 68111

²Bachelor of Applied Science, Faculty of Applied Science, Politeknik Kesehatan, 68121

³Bachelor of Pharmacy, Faculty of Health Sciences, Universitas dr. Soebandi, 68111

Email: della.ut4mi@gmail.com

Abstract

Introduction: The hospital formulary contains a list of drugs that have been agreed upon by the medical staff and compiled by the Therapeutic Pharmacy Team (TFT) which is determined by the hospital director. The hospital formulary serves as a quality and cost control for drugs that will facilitate rational drug selection, reduce medical costs, and optimize services to patients. **Objective:** This study aims to identify the suitability of standardized prescription writing with the hospital formulary. **Methods:** This study used a descriptive observation method with the source of medical record data for inpatients and outpatients with heart disease in October-December 2023 as many as 154 with total sampling technique. **Results:** The results of this study showed that the suitability of prescription writing with the hospital formulary was 98.93% and those that were not in accordance with the hospital formulary were 1.03%. **Conclusion:** The conclusion in this study is that almost all prescriptions for heart disease patients are in accordance with the Hospital Formulary.

Keywords: Appropriateness, Hospital formulary, Heart disease

Abstract:

Introduction: Hospital forms contain a list of medicines that have been agreed upon by the medical staff, compiled by the Pharmaceutical Therapy Team (TFT) established by the director of the hospital. Hospitals forms serve as quality and cost controls that will facilitate rational drug selection, reduce treatment costs, and optimize patient service. **Purpose:** The study aimed to identify the compatibility of standard prescription writing with hospital forms. **Methods:** This study used a descriptive observation method with data sources from medical records of inpatient and outpatient heart disease patients in October-December 2023, with a total of 154 sampling techniques. **Results:** The results of this study showed that 98.93% of prescription writings matched hospital forms and 1.03% did not match the hospital form. **Conclusion:** The conclusion in this study is that almost all prescriptions for heart disease patients are in accordance with the Hospital Forms.

Keywords: Appropriateness, Hospital Formulary, Heart disease

INTRODUCTION

The hospital formulary contains a list of drugs that have been agreed upon by the medical staff and compiled by the Pharmacy and Therapeutics Team (TFT) as determined by the hospital director (Aziz *et al* 2021). The Hospital Formulary refers to the National Formulary. In the JKN era, the prescription given must be in accordance with the hospital formulary, if the



prescription is not in accordance with the hospital formulary, it will affect the quality of installation services in the hospital (Nopitasari *et al* 2020).

The impact of non-compliance in writing prescriptions can affect the logistics of drug supply, resulting in an increase in investment to meet drug needs beyond predetermined standards. In addition, the quality of hospital pharmacy installation services will not be optimal because there will often be drug vacancies which result in longer service times to purchase drugs outside the hospital. The long-term effect is a decline in the image of the hospital which ultimately has an impact on the number of patients (Pradiana and Sunarsi, 2021).

The utilization of the formulary as a tool to improve the efficiency of drug management is still not optimal. For patients, the formulary can facilitate planning in the selection of selected drugs that are appropriate, efficacious, quality, safe and affordable so that the drugs listed in the formulary must be guaranteed availability (Minister of Health, 2020c).

However, in the management at the hospital, not all can implement what has been determined by the formulary. This is a problem, because the standard for writing prescriptions according to the formulary is 100% (Tuloli *et al* 2022). According to the results of previous studies, the acceptance of the formulary has not been implemented properly. The probability of doctors prescribing drugs in accordance with the formulary is 71% (Risnawati and Lakoan, 2023). Based on the results of research by Ni'matunnisa and Nurwahyuni (2021), it is stated that the level of conformity of doctors in prescribing with the formulary is 79.4% .

Based on the results of the research Ni'matunnisa and Nurwahyuni (2021) and Risnawati dan Lakoan (2023), the suitability of prescription writing with the formulary is not in accordance with the prescribing indicators. So that similar research is carried out at Citra Husada Hospital.

METHODS

This research was conducted at citra husada hospital in June-July. The method used in quantitative descriptive observational method. Descriptive observational research method is a research method by describing a situation or problem through observations that occur in the field or certain communities, including in the field of medical records (Pratiwi *et al* 2017). The data source of this research is the medical records of outpatients and inpatients in heart disease for the period October-December 2023 as many as 154 with total sampling technique.

RESULTS AND DISCUSSION

General Data

The following is the distribution of respondents based on gender and age characteristics

From the results of the study it can be seen that citra husada hospital patients are more dominated by male patients as many as 80 patients with a percentage of 51.95% while patients with female gender are 74 patients with a percentage of 48.05%. Men suffer more from heart disease than women. Women have the hormone estrogen which functions to protect against heart disease, so the risk of women developing heart disease is small, but women are at risk when menopause occurs (Ghani *et al* 2016). This is in line with the research of Ginanjar *et al* (2022) in an inpatient installation in Jakarta that men have a higher frequency of 18 (69.23%) than women as many as 8 (30.77%).



As the age of the individual increases, the ability of the tissues and organs of the body will decrease in carrying out their respective functions (Johanis *et al* 2020). At the age of 51-60, the body has experienced a decrease in the function of organs due to the aging process, the immune system as a protector of the body does not work as strongly as when it was young, which is the reason why people who enter old age range from being attacked by various diseases, and visit health facilities. The results of this study are in accordance with the results of research by Yunus *et al* (2021) at the Hajj Calling Health Center, Anak Tuha District, Central Lampung with the results of most respondents aged 51-60 as many as 135 with a percentage of 50.4%. The results of research by Desky and Susanto (2021) at the Kutacane City Health Center, Babusalam District, Southeast Aceh, aged 50-62 as many as 32 with a percentage of 84.3%.

Special Data

The following are the frequency characteristics of the suitability of prescription writing and drug classes in heart disease at the citra husada hospital

Based on table 2. shows that the total number of drug prescriptions is 154 prescriptions, which are in accordance with the hospital formulary as many as 152 drug prescriptions, and those that are not in accordance with the hospital formulary are 8 drug items. The total suitability of drug items was 795 items, drug items that were in accordance with the formulary were 795 and drug items that were not in accordance with the formulary were 8 items. The suitability of prescribing with the hospital formulary was 98.93%. In this study, the percentage of prescribing suitability was 98.93%, with this percentage it can be seen that prescribing is good because most of it meets the hospital formulary, although it is not appropriate because it does not meet the established standard of 100% (Minister of Health, 2020c).

In this study, there were several drug prescriptions that were not in accordance with the hospital formulary. This was due to complaints and wishes from the patient's family about the drugs to be used so that the doctor made the decision to use drugs outside the hospital. In addition, the use of drugs prescribed to inpatients has received drugs when the patient is still outpatient so that doctors only prescribe drugs for concomitant diseases. Based on research by Yunarti (2022), the factors that cause doctors to prescribe drugs outside the formulary are due to considerations that the prescribed drugs are more effective for consumption by patients, compared to drugs listed in the hospital formulary (especially for patients who have a history of disease and are only compatible with certain drugs). This is supported by research by Aziz *et al* (2021) that internal factors from doctors include education, workplace environment, information received from colleagues, and interactions with patients.

In this study, some groups of drugs that were widely prescribed were Beta blockers. Beta blockers are the first line of treatment to control heart rate and reduce or prevent the onset of symptoms in stable coronary artery cardiovascular disorders (Sari *et al*, 2021). The mechanism of action in the use of Beta blockers by inhibiting the interaction of epinephrine, norepinephrine and sympathomimetic drugs with beta receptors. This is also in accordance with the medical therapy guidelines for heart disease with a decrease in ejection fraction by the *American Heart Association* (AHA) in 2021 which recommends the administration of Beta blockers (Radhiyyah *et al*, 2022). One class of Beta blocker drugs is Bisoprolol. The use of the drug Bisoprolol by blocking beta adrenergic receptors with the effect of reducing the work of the heart ung but if combined with the drug amlodipine it will reduce myocardial contractility



so that the joint use of these two drugs causes unwanted effects, namely hypotension and bradycardia (Mariam, 2016).

In this study, the class of heart disease drugs that are often used after beta blockers is the Anti-thrombolytic group. Anti-thrombolytics are a class of blood thinning drugs. The mechanism of action of anti-thrombolytics is to prevent blood clots in the blood vessels because they can cause narrowing of blood flow in the blood vessels and cause cell death in the heart (Hasanah *et al*, 2021). One class of anti-thrombolytic drugs is Clopidogrel. Indications for the administration of clopidogrel based on *guidelines* published by the *American Heart Association* (AHA) are as cardiovascular therapy with atherosclerosis such as acute coronary syndrome (SCS) and stroke (Wijaya, 2021).

The third frequently used drug is Angiotensin II antagonists. Angiotensin II antagonists or the Antagonist Receptor Blocker (ARB) class function to inhibit the binding of angiotensin II and ATI responders that are widely found in tissues (smooth muscle, blood vessels and adrenal glands). Angiotensin will be converted with the help of the hormone renin, the changes will become Angiotensin I. then angiotensin I will be converted into Angiotensin II with the help of an *enzyme*, namely *Angiotensin I converting enzyme* (ACE) found in the lungs. The role of angiotensin II is important in regulating blood pressure (Marhabatsar, 2021). Drugs classified as Angiotensin II Antagonist drugs such as valsartan and candesartan (Anggriani *et al*, 2017).

In prescribing a drug, there are several prescriptions that are not allowed to be given simultaneously. For example, ACE inhibitors and Angiotensin II antagonists can have additive or synergistic effects on the renin (Angiotensin) system, potentially increasing the risk of hyperkalemia and kidney damage. The combination of these two classes of drugs has no additional benefit, compared to monotherapy. However, if the combination is considered medically necessary, blood electrolytes (especially potassium), blood pressure, and renal function should be closely monitored by the doctor (Islamiyah, 2020).

Additional drugs used in the treatment of heart disease are due to comorbidities in heart disease such as diabetes mellitus, hypertension, and dyslipidemia. The most widely used adjunctive drugs in this study such as spironolactan, furosemide, simvastatin are not part of the cardiovascular group. Spironolactan and furosemide are a combination of two drugs from the diuretic group while simvastatin is from the statin group. Furosemide is a drug to reduce edema in patients with heart disease. The mechanism of action of furosemide by inhibiting the transport of $\text{Na}^+/\text{K}^+/\text{Cl}^-$ which is actively transported out of the cell into the interstitium by a pump that depends on Na^+/K^+ -ATPase at the basolateral membrane which will cause a decrease in blood pressure. The effect of furosemide is to increase potassium output, causing hypokalemia and making patients feel unenergetic (Wulandari, 2017). Therefore, spironolactan is given, spironolactan is a potassium-sparing drug that can be combined with furosemide. The mechanism of action of spironolactan drugs by blocking aldosterone binding to cytoplasmic receptors so as to increase the excretion of Na^+ (Cl^- and H_2O) and reduce the secretion of K^+ which is strengthened by electricity which causes potassium expenditure to be held and no hypokalemia occurs (Nopitasi *et al*, 2020). Simvastatin is a class of statin drugs. The mechanism of action of simvastatin is by inhibiting HMG CoA by inducing an increase in LDL receptors which can increase the amount of LDL extraction in the liver thereby reducing LDL levels in plasma (Bhakti, 2023).

The discrepancies in this study amounted to 8 drug items, this happened because some patients needed the drug, so the doctor prescribed it. Even so, drugs that are not in



accordance with the formulary will be recorded and discussed during the hospital formulary evaluation and can be revised for the hospital formulary in the following year.

CONCLUSIONS

Based on the results in research on outpatients and inpatients with heart disease patients in October November December as many as 154 and almost all prescriptions are in accordance with the Hospital Formulary.

LITERATURE

Anggriani, A., Herawati, I., & Budiastuti, J. (2017). Evaluation of the Use of Angiotensin Receptor Blocker Hypertensive Drugs in Patients with ACE Inhibitor Intolerance. *Galenika Pharmacy Journal*, 4(1), 20-25.

Azis, M. I., Endarti, D., Satibi, S., & Taufiqurohman, T. (2021). Conformity of Analgesic Group Drug Use to the National Formulary and Hospital Formulary at Rs Akademik Ugm Yogyakarta. *PHARMACY: Pharmaceutical Journal Of Indonesia*, 18(2), 213-225.

Bakti, A. N. (2023). Overview of the Use of Simvastatin and Atorvastatin in Coronary Heart Patients at Drs. Saydiman Magetan Hospital. *Acta Holistica Pharmacia*, 5(1), 22-29.

Desky, R., & Susanto, B. (2021). Relationship between Risk Factors and Coronary Heart Disease Incidence Rates at the Kutacane City Health Center, Babusalam District, Southeast Aceh Regency in 2020. *Journal of STM Medicine (Science and Medical Technology)*, 4(2), 83-89.

Ghani, L., Susilawati, M. D., & Novriani, H. (2016). Dominant Risk Factors of Coronary Heart Disease in Indonesia. *Health Research Bulletin*, 44(3), 153-164.

Ginanjar, I., Puspaningrat, L. P. D., & Candra, I. G. N. P. (2022). Study of Acute Myocardial Infarction Drug Use in the Jakarta XYZ Hospital Inpatient Installation. *Kryonaut Pharmacy Journal*, 1(1), 32-36.

Hasanah, N., Putajaya, F., Kania, L., Ismaya, N. W. A., & Aini, N. N. (2021). Overview of Heart Disease Based on Demographics and Drug Use. *Journal of Health*, 10(1), 100-110.

Islamiyah, A. N. (2020). Review of Potential Drug Interactions of Heart Clinic Polypharmacy Prescriptions at One of the Hospitals in Bandung. *Kartika: Scientific Journal of Pharmacy*, 8(1), 25-35.

Johanis, I., Hinga, I. A. T., & Sir, A. B. (2020). Risk Factors of Hypertension, Smoking and Age on the Incidence of Coronary Heart Disease in Patients at Rsud Prof. Dr. Wz Johannes Kupang. *Public Health Media*, 2(1), 33-40.

Marhabatsar, N. S. (2021). Hypertensive Disease in the Cardiovascular System. In *Proceedings of the National Seminar on Biology* (Vol. 7, No. 1, Pp. 72-78).

Mariam, S. (2016). Evaluation of Drug Interaction Events in Geriatric Hospitalized Patients with Heart Failure. *Pharmamedika Journal*, 1(1), 28-33.



Minister of Health Ri. 2020a. Regulation of the Minister of Health of the Republic of Indonesia Number Hk.01.07/Menkes/200/2020 concerning Guidelines for the Preparation of Hospital Formularies. Jakarta: Ministry of Health of the Republic of Indonesia

Minister of Health Ri. 2020c. Government Regulation of the Republic of Indonesia Number 200 of 2016 concerning Guidelines for the Preparation of Hospital Formularies, Jakarta

Narulita, S. W., & Aprianti, E. (2020). Evaluation of the Appropriateness of Prescribing Supplements to the Hospital Formulary in Inpatients at the Pharmacy Installation of One of the Private General Hospitals in Bandung City. *Journal of Health Science*, 1(4), 235-242.

Ni'matunnisa, E., & Nurwahyuni, A. (2021). Analysis of Physician Compliance in Prescribing National Formulary Drugs at Multazam Medika Hospital in 2018. *Jkm (Journal of Public Health) Cendekia Utama*, 9(1), 29-39.

Nopitasari, B. L., Nurbaety, B., & Zuhroh, H. (2020). Evaluation of Antihypertensive Drug Use in Outpatient Heart Failure Patients at the Regional General Hospital of West Nusa Tenggara Province. *Lambung Farmasi: Journal of Pharmaceutical Sciences*, 1(2), 66-72.

Pratiwi, W. R., Kautsar, A. P., & Gozali, D. (2017). The Relationship between Prescription Writing Conformity with National Formulary and Quality of Service for National Health Insurance Patients at Public Hospitals in Bandung. *Pharmaceutical Sciences And Research*, 4(1), 5.

Priadana, M. S., & Sunarsi, D. (2021). *Quantitative Research Methods*. Pascal Books.

Radhiyyah, H. D., Adiputro, D. L., Biworo, A., Rudiansyah, M., & Illiandri, O. (2022). Overview of Beta Blocker Administration in Heart Failure Patients at Ulin Banjarmasin Hospital. *Homeostasis*, 5(1), 69-76.

Risnawati, D., & Lakoan, M. R. (2023). Compliance of Outpatient Prescription Writing for Subspecialist Bpjs Patients with the National Formulary (Fornas) at X Depok Hospital January-March 2022 Period. *An-Najat*, 1(2), 84-96.

Sari, O. M., Cahaya, N., & Susilo, Y. H. (2020). Study of the Use of Beta-Blocker Group Drugs in Inpatients of Ansari Saleh Banjarmasin Hospital. *Udayana Pharmacy Journal*, 9(2), 123.

Tuloli, T. S., Madania, M., Rasdianah, N., & Gobel, I. P. (2022). Evaluation of the Appropriateness of Drug Prescribing in Internal Medicine Polyclinic Patients Against the Formulary in the Hospital. *Journal Syifa Sciences And Clinical Research*, 4(1).

Wijaya, D. (2021). Review of Clopidogrel Drug Interactions with Proton Pump Inhibitors (PPIs) in Cardiovascular Event Therapy.

Wulandari, T. (2017). Overview of Drug Use in Congestive Heart Failure Patients Hospitalized at Sultan Syarif Mohamad Alkadrie Hospital Pontianak. *Journal of Pharmacy Students, Faculty of Medicine UNTAN*, 3(1).

Yulina, R. (2024). An Overview of the Accuracy of Outpatient BPJS Drug Prescribing with the National Formulary at Hospital X, East Jakarta, December 2022-February 2023:-. *Indonesian Journal of Health Science*, 4(2), 99-104.

Yunarti, K. S. (2022). Analysis of Drug Availability and Prescribing with Formulary at Hospital X Karanganyar Regency. *Journal of Bina Cipta Husada: Journal of Health and Science*, 18(2), 152-161.



Yunus, M., Aditya, I. W. C., & Eksa, D. R. (2021). The Relationship Between Age and Gender with the Incidence of Hypertension at the Hajj Pemanggilan Health Center, Anak Tuha District, Central Lampung Regency. *Journal of Medicine and Health Sciences*, 8(3), 229-239.



Table and figure

Table 1. Frequency distribution characteristics of respondents

Characteristics	Frequency	Percentage (%)
Gender		
Male	80	51,95
Female	74	48,05
Age (Years)		
31-40	3	2
41-50	18	11,7
51-60	57	37
61-70	44	28,6
71-80	25	16,2
>81	7	4,5

Table 2. Frequency distribution characteristics based on the class of heart disease drugs at citra husada hospital

Drug class	Frequency	Percentage (%)
Anti-angina	37	7,23
ACE Inhibitors	6	1,17
Beta Blockers	146	28,52
Calcium Antagonist	61	11,91
Angiotensin II antagonists	128	25
Other anti-hypertensives	3	0,59
Heart failure	2	0,39
Anti-thrombolytic	129	25,19
Total	512	100



Diagram 1. Frequency distribution characteristics of the suitability of prescription writing with the formulary of citra husada hospital

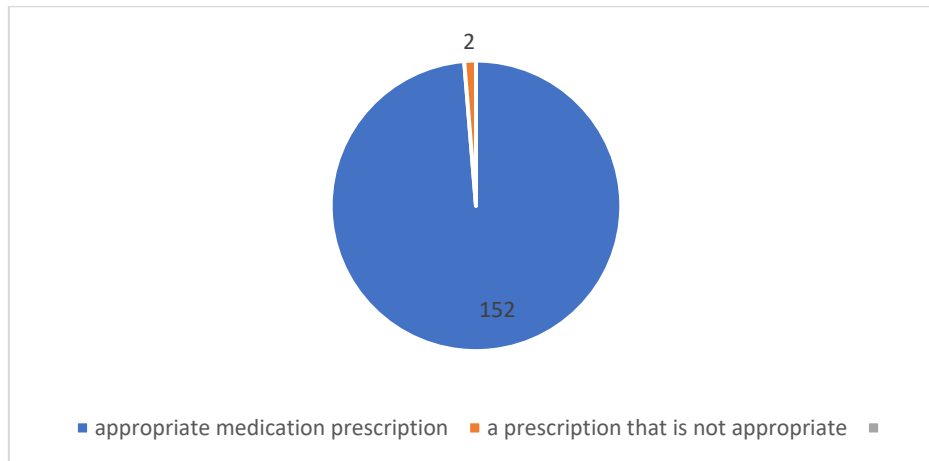


Table 3. Frequency distribution characteristics based on drug items with additional drugs

Amount of medicine	Frequency	Percentage (%)
1 drug	48	34,53
2 drugs	54	38,84
3 drugs	26	18,70
4 drugs	8	5,76
5 drugs	3	2,16
Total	139	100

