

Research Study of Management of Drug Related Problems (DRPS) in Patients with Congestive Heart Failure (CHF)

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ABSTRACT

Drug Related Problems (DRPs) are defined as conditions in the management of patient therapy that has the potential to interfere with achieving the desired results. This literature study aims to determine the frequent occurrence of Drug Related Problems (DRPs) and to determine the management of incidents Drug Related Problems (DRPs) in patients with Congestive Heart Failure (CHF). A literature analysis search was conducted by determining the inclusion and exclusion criteria using the keywords Management Drug Related Problems (DRPs), Drug Related Problems (DRPs), Congestive Heart failure, searched using the search engine PubMed, Science Direct, and Google Scholar. The results of the literature analysis were obtained (8248) articles and excluded as many as (8,234) articles, then filtered and obtained 14 articles that were relevant and according to the inclusion criteria. All the information that has been obtained is synthesized by analyzing the journal to obtain information about the incidence of DRPs. The results of the literature review show that there are 8 categories of DRPs identified, these problems showed that the management of DRPs is still not optimal so that it has a negative impact on patient care outcomes. The conclusion is that the most frequent DRPs require additional therapy, and the category with the highest percentage of the 8 categories is the interaction category.

Keywords: Drug Related Problems (DRPs) of Congestive Heart failure, Management Drug Related Problems(DRPs).

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INTRODUCTION

The prevalence of heart disease in Indonesia according to Riskesdas 2018, is 1.5% for diagnosed doctors of all ages. In South Sulawesi, the prevalence of heart disease reaches 1.4% diagnosed by doctors¹.

The increasing prevalence of heart disease in Indonesia has also resulted in an increase in the need for therapy for people with heart disease, a type of heart disease, namely Congestive Heart Failure (CHF) or commonly known as congestive heart failure. Patients with congestive heart failure are generally given several types of treatment such as vasodilator drugs, diuretic drugs, inotropic drugs². And congestive heart failure sufferers also usually suffer from comorbidities that will require additional various kinds of drugs in their therapy, so that the handling of congestive heart failure patients will also be more difficult. Giving various kinds of drugs without proper consideration can have detrimental effects for patients because they can cause or cause various problems, for example, changes in the effect of drug therapy, side effects, and many more.

Drug Related Problems (DRPs) are events that involve drug therapy that affect the patient's potential or therapeutic outcome.³ Problems related to DRPs are defined as conditions in the management of patient therapy that cause or have the potential to result in not achieving optimal therapeutic results. DRPs can occur at all steps of the treatment process, particularly during prescribing, transcription, dispensing, and use of drug therapy by patients. Some of the consequences that can arise from the presence of DRPs include failure of the indication for untreated, causing side effects from drug use, the risk of resulting in decreased quality of life, increasing the average mortality and disability rate, and increasing the cost of treatment⁴. Pharmacists have a role in helping to ensure that the therapy received by patients is the best by identifying potential and actual DRPs and preventing medication errors³.

In order to improve the therapeutic outcomes of patients with heart failure, this patient care should be integrated into a multidisciplinary management program, where patients receive care from practitioners with expertise in their fields. Medication therapy management (MTM) is a strategy to provide patients with the necessary range of clinical pharmacy services, this is the structure to provide pharmacists with what has been referred to since the 1990s as pharmaceutical care. These medication management services should optimize therapeutic outcomes by identifying and resolving drug therapy problems. These elements include medication therapy reviews, personal medication records, treatment action plans, referral interventions for drug therapy issues, and documentation and planning for treatment and implementation.

Since an increasing number of people with congestive heart failure can provide a high chance of developing DRPs, that it needs special attention or management in the handling of congestive heart failure from health workers, especially problems that occur during treatment. Therefore, a literature study on the management of drug related problems in congestive heart failure patients was compiled.

This literature study aims to determine the types of Drug Related Problems (DRPs) that often occur and to determine the management of incidents Drug Related Problems (DRPs) in patients with Congestive Heart Failure (CHF). And it is hoped that this literature study, it can be used as a source of information and guidelines related to the incidence of Drug Related Problems (DRPs) for sufferers of Congestive Heart Failure so that it can increase the effectiveness of rational therapy and support the patient's quality of life.

METHODOLOGY

A. Type of Research

This research is a study literature review using a qualitative approach to synthesizing (summarizing) the results of a qualitative descriptive study. This method of synthesizing (summarizing) the results of qualitative research is called "meta-synthesis". By definition, meta-synthesis is a technique of integrating data to obtain new theories or concepts or a profound and more comprehensive level of understanding⁵

B. Literature Search Strategy

The selection of search literature reviews uses the principle PRISMA Flow Diagram. Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA). The use of the PRISMA method in selecting literature review studies provides convenience, where the PRISMA method has an outline search principle for all journal articles that will be identified based on specified keywords and inclusion criteria, resulting in journals that will be analyzed according to predetermined parameters.

1. Keywords that are used in collecting journal or article: Management Drug Related Problems (DRPs), Drug Related Problems (DRPs), Congestive Heart failure.
2. Database or search engine used: Google Scholar, PubMed, Science Direct.
3. Inclusion Criteria
 - a. The maximum journal publication period is 10 years
 - b. Using Indonesian and English.
 - c. Original journal type research articles
 - d. The theme of the journal content is the study of Drug Related Problems (DRPs) in heart failure patients.
 - e. The DRPs classification to be analyzed is based on Cipolle, Strand, & Morley. 2012.
4. Exclusion Criteria
 - a. Journal publication period is under 10 years
 - b. Inaccessible full text Unfavorable
 - c. Poor analysis resultzts

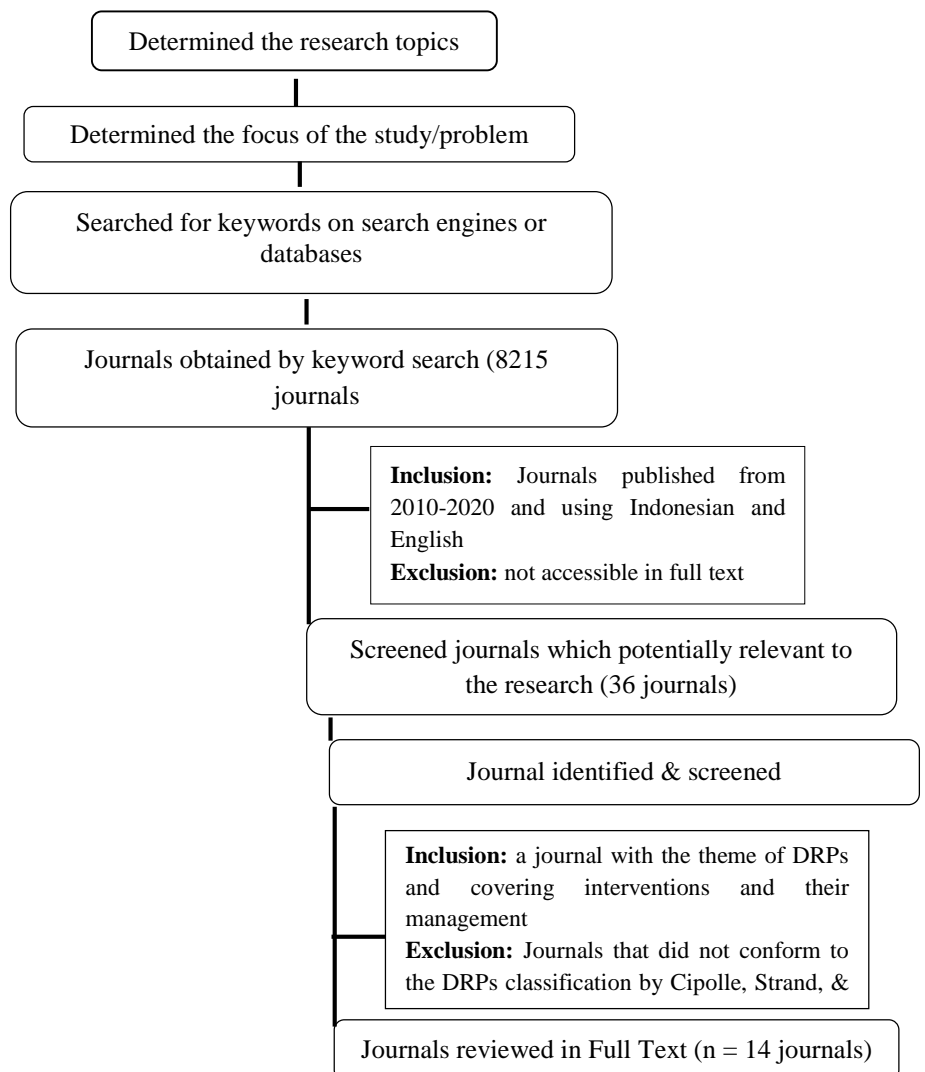


Figure. Research Work Scheme.

RESULTS AND DISCUSSION

Titles and abstracts of the articles were filtered and assessed for relevance, resulting in 14 articles. The results search using keywords and inclusion criteria through searches on the search engine PubMed were 136 articles, excluding 131 articles and the remaining 5 articles. From the Science Direct obtained 112 articles, 110 articles were excluded, and the remaining 2 articles. From Google Scholar, 8000 articles were obtained, 7993 articles were excluded, and the remaining 7 articles.

The results of Utami, which is non-experimental research with retrospective data collection showed that there were 3 DRPs, namely 5 (11.36%) additional therapy, with one of the incidents in patients who had the disease. Comorbid benign prostate hyperplasia (BPH) is not treated. And the therapeutic solutions that should be given are tamsulosin and doxazosin which are the 2nd generation of α adrenergic antagonists. The 2nd category of DRPs was unnecessary therapy as much as 4 (11.36%), with the incidence of cilostazol use in patients with congestive heart failure. The drug cilostazol is given to patients with heart failure while cilostazol therapy should be avoided in patients with congestive heart failure because it is associated with cardiovascular events and mortality. Category 3 interactions were 35 (75.4%), with the incidence of giving lisinopril together with spironolactone in patients with CHF the impact of the two drugs if given simultaneously can cause hyperkalemia.⁶

From the results of Sinjal, which is an observational descriptive study with retrospective data collection, it shows that the identified DRPs category is a category that needs additional therapy as many as 13 (14.44%) with one of the incidents, 11 patients were suffering from hyperuricemia but not getting therapy. And the therapy that can be given is the drug allopurinol which is a drug that can treat hyperuricemia. The 2nd DRPs category of drug therapy does not need as much as 1 (1.11%), named the administration of ceftriaxone in patients although the patient does not have a history of infection, this can actually have an adverse drug reaction effect on the patient. The 3rd category of ineffective drugs is 2 (2.22%), that is, there are 2 patients with congestive heart failure who are given warfarin therapy, and the therapy that should be given is a combination of ACEI and Beta Blocker, where this drug is the first-line therapy in patients with failure congestive heart. Furthermore, the category of the drug dose was too low as many as 5 (5.56%), that is, the patient was given ramipril therapy at a dose of 1.25 mg, while the dose of ramipril was according to the guidelines, namely 2.5 mg once a day, the next category the drug dose was too high as many as 3 (3.33%), with one incident in the administration of spironolactone therapy with a high dose of 50 mg per 12 hours. Meanwhile, based on the guidelines, the dose of spironolactone should be 12.5-25 mg per day, then increase it to 50 mg per day. The next category is the interaction problem with 53 incidents (58.89%), with one of the incidents of ramipril and spironolactone administration, where the two drugs are given simultaneously it can cause hyperkalemia.⁷

The result analysis of Nurcahaya, *et al.*, in the journal management and pharmacy services with observational research and data collection prospectively demonstrated DRPs identified categories, the need for additional drug therapy as much as 7 (3.65%), with one of the incidents of patients experiencing hypercholesterolemia with LDL levels > 130 mg / dL but the absence of therapy in these patients. And therapy according to the guidelines that

should be given is the drug simvastatin which can reduce LDL levels experienced by patients. The second category of drug therapy does not need as much as 14 (7.29%), with one incidence of patients who were given analgesic therapy meloxicam but did not experience pain. The administration of this drug may cause adverse effects or adverse reactions in patients. Category 3 drugs were not effective as much as 16 (8.33%), with one of the incidences of glucosamine administration in osteoarthritis sufferers. Meanwhile, according to the guidelines, the glucosamine administration does not provide a good effect or improvement on osteoarthritis experienced by patients. In the fourth category, the dose of the drug was too low as many as 15 (7.81%), with one of the incidents of giving antihypertensive drugs, where the dose of the drug given was within the recommended dosage range but the effectiveness of the drug against the patient's blood pressure had not reached the target in the range of normal blood pressure. The fifth category of adverse drug reactions was 12 (6.25%), with one of the incidence of gastric pain experienced by patients as a result of giving aspirin therapy, where gastric pain was one of the side effects of aspirin. The sixth category of drug interaction problems occurred as many as 71 events (36.98%), with one of the interactions between furosemide and digoxin, where furosemide can cause loss of potassium so that it spurs digoxin to induce arrhythmias. This can be treated by replacing the furosemide with a potassium-sparing diuretic.⁸

The result analysis of Arini, *et al.*, in the journal of management and pharmaceutical services show 5 identified categories of DRPs, namely the first category Need additional therapy as many as 46 (24.73%) incidents, with one incidence of hypertensive patients not receiving therapy. And the therapy that can be given is ACEi / ARB because it can reduce blood pressure experienced by patients. The 2nd category of unnecessary drug therapy was 10 (5.92%), with one incidence of patients receiving ranitidine and lansoprazole while the patient had no gastrointestinal abnormalities and no diagnosis associated with these therapies. The third category of drugs was not effective as much as 38 (20.43%), with one of the incidents of giving bisoprolol which is a non-selective beta-blocker in hypertensive patients which can cause hypoglycemic effects, so it is advisable to give therapy with selective beta-blockers such as carvedilol especially in patients who are on insulin therapy. Category 4 the dose is too low as many as 9 (4.48%), with one incident of giving bisoprolol at a dose of 1 x 1.25 mg for hypertension therapy, while the dose is low because in the usual dosage guidelines bisoprolol for hypertension is 2.5-10 mg per day. The fifth category of interaction problems that occurred was 41 (36%), with one of the incidents of giving amlodipine and simvastatin simultaneously, where amlodipine would inhibit the metabolic process of simvastatin so that it would increase the concentration of simvastatin in the body.⁹

The result of Rosmiati, showed that the DRPs category is in need for additional therapy as many as 14 (26.41%), with one incident 3 patients experienced hyperglycemia but these patients did not receive antidiabetic therapy, the second category of drug therapy did not need as much as 9 (16.8%), with one incident 6 patients received lansoprazole and ranitidine therapy, but the patients did not experience gastrointestinal abnormalities. The third category is the category of ineffective drugs as much as 1 (3.77%), with one incidence of hyperkalemia patients

receiving spironolactone therapy, and in the guidelines, the use of spironolactone should be avoided in hyperkalemia conditions, because it can worsen hyperkalemia experienced. Category 4 the dose of the drug was too low as much as 9 (16.98%), with one incident of giving warfarin at a given dose of 2 mg per day, while the dose of warfarin was based on the guideline 10 mg per day followed by a maintenance dose of 2 mg per day. The fifth category of drugs that were too high was 20 (37.73%), with one incident there were 2 patients using digoxin at a dose of 0.5 mg per day, which is what the dose should be based on the guidelines, namely 62.5- 125µg per day. The 6th category of adverse drug reactions was 24 (45.28%), with one of the incidents there were 11 patients using captopril which resulted in coughing which is a side effect of using captopril, especially with prolonged use. The 7th category of non-adherence was 2 (3.77%), with one incidence of patients who did not want to take the drug so that the effectiveness of the therapy could not be maximized. The 8th category of interaction problems was 27 (50.94%), with one incident using furosemide and digoxin simultaneously causing hypokalemia.¹⁰

The result of Niriayo, *et al.*, in the plos one journal showed that there were 4 identified categories of DRPs, namely the first category needed therapy as many as 241 (27.3%), were the drugs most often involved in this therapeutic problem were BB and ACEi. BB and ACEi are both recommended in people with systolic heart failure, but they are not given. The second category was 234 (26.5%) ineffective drugs, where the drug most often involved in this therapy problem was BB. The use of BB such as atenolol is less effective in the treatment of heart failure. In the guidelines, it is explained that the recommended use of BB for heart failure patients is 3 beta-blocker drugs including metoprolol, carvedilol, and bisoprolol. Category 4 the dose was too low as many as 245 (27.8%), where the drugs that most often caused problems in this therapy were the use of beta-blockers and ACEIs at doses that were not following the guidelines. The next category is the non-adherence category as much as 70 (8.75%), for example, patients who do not want to take medication or rarely take medication when the patient's disease relapses, this can actually worsen the patient's condition.¹¹ The result analysis of Hsu, Shen and Lee, in the Journal of the Formosan Medical Association, show 3 categories of DRPs. The first category is the category of adverse drug reactions as many as 106 (13.3%), with one of the occurrences of drug use that often causes side effects, specifically the use of warfarin drugs, where the side effects that arise when using warfarin are anemia and bleeding. The second category of non-adherence was 76 (9.5%) incidents, with one of the incidents of lack of awareness of the patient in taking the drug given, or the patient refusing to take the drug, where the most common drugs associated with non-adherence were ACEI and diuretics. The third category of interaction problems occurred as many as 236 (29.6%), in which one of the events, namely the use of spironolactone and ACEI drugs simultaneously can cause hyperkalemia, so it is necessary to monitor the level of potassium in the blood.¹²

The result analysis of Gizaw, 2017, in the Journal of natural science research show 7 identified incidents of DRPs, for the first category is in need of additional therapy as many as 54 (33.12%). The use of antiplatelets in cardiovascular management is often needed to treat cardiovascular problems, where the mechanism of action of antiplatelets is to inhibit thrombus formation in arteries

and prevent cardiovascular events such as heart attacks, category 2 drug therapy is not necessary as much as 10 (6.14%), where the drugs that often cause problems in this therapy are CCB and ACEI drugs, both drugs are given but the patient does not experience a diagnosis related to the two drugs. The third category of drugs was 17 (10.43%) ineffective, where the drug that most often caused this problem was diuretic drugs. Diuretic administration is not optimal, so the need for drug replacement to provide maximum therapeutic results. The fourth category of drug doses was too low as much as 4 (2.45%), where the drugs that most often caused this problem were CCB drugs and diuretics. The administration of these two drugs is not in accordance with the recommended dosage or those in the guidelines. The fifth category of drug doses was too high as many as 8 (4.90%), where the drug that most often caused problems in this therapy was diuretic, whose administration was not in accordance with the guidelines. The 6th category of adverse drug reactions was 21 (12.88%), in which the most frequent drug causing problems for this therapy was NSAIDs. Administration of NSAID therapy to cardiovascular patients generally experiences side effects, namely gastric pain, nausea, and vomiting. The 6th category is the non-compliance category as much as 46 (28.23%), with the average incidence of patients not understanding the information provided, forgetting to take medication, expensive medicinal products. This non-compliance can actually worsen the patient's condition.¹³ The result analysis of Peterson and Gustafsson, in the Drugs - Real World Outcomes journal showed 6 identified categories of DRPs events. The first category needed additional therapy which occurred in 12 (9%), there were obstipating conditions experienced by patients, so it was necessary to initiate therapy such as laxatives to overcome the obstipated condition. The second category of unnecessary drug therapy occurred in 6 (5%), for example, the administration of omeprazole, prednisolone, simvastatin therapy but in patients who did not experience any medical conditions associated with these therapies, this could harm the patient. The third category of ineffective drugs is 1 (1%) which the use of thiazide drugs in patients with low GFR, the guidelines explain that thiazide drugs are not given to patients with a glomerular filtration rate <30 ml/minute, but for glomerular filtration rate conditions <30 ml/min should be given the loop diuretic class. Category 4 the dose is too low as many as 3 (2%) events, for example, in the administration of cefotaxime and pregabalin with low doses, the drug is given below the recommended dose will cause the achievement of therapy is not achieved. Category 5 the dose is too high as much as 12 (9%), such as the use of candesartan, digoxin, esomeprazole which is given in high doses and not according to guidelines, so it is possible to give toxic effects to patients. The 6th category was 11 (8%) adverse drug reactions, one of which was patients who experienced reactions of nausea and fatigue as a result of the side effects of using digoxin. The sixth category of non-adherence was 11 (8%), for example in patients who were given formoterol, budesonide, furosemide, simvastatin therapy but did not take these drugs as prescribed, this non-compliance would have an impact on the patient's condition worsening. The 7th category of interaction problems is 21 (16%), for example, when taking omeprazole and doxycycline when taken simultaneously, doxycycline can reduce omeprazole levels

by reducing drug absorption in the body so that omeprazole does not provide the effect it should.¹³

The research of Bayoud, *et al.*, in the *Annales Pharmaceutiques Francaises* journal, showed that there were 5 identified categories of DRPs events which needed for additional therapy that occurred as many as 78 events, where the drug most often involved in this therapeutic problem were analgesics/antipyretics and cardiovascular agents, it is necessary to add these therapies because of the diagnosis associated with these therapeutic problems. The second category of drug therapy does not need to be as many as 116. The drugs most often involved in this therapy problem are antibiotic agents and gastrointestinal agents. Giving both of these therapies, should not be done because there is no diagnosis or disorders such as infections and gastrointestinal disorders that support the provision of these therapies, even can give bad reactions to patients. The third category of ineffective drugs occurred in 78 events, where the drugs most often involved in this therapeutic problem were anti-infective agents and analgesic / antipyretic agents. The fourth category of drug doses was too low as many as 118 events, where the drugs most often involved in this therapeutic problem were anti-infective agent drugs and analgesic/antipyretic agent drugs, the administration of these drugs was not as recommended or not following the guidelines, so that when given in low doses, they may not achieve maximum therapeutic effectiveness. The fifth category of drug doses is too high as many as 206, the drugs most often involved in this therapeutic problem are anti-infective agent drugs and analgesic / antipyretic agent drugs. Administration of high doses of drugs not based on guidelines can have toxic effects that can worsen the patient's condition.¹⁵

The result analysis of Campbell, *et al.*, in the *Journal of the American Health Drug Benefits* show that there are 7 categories of DRPs occurring, namely the category of the need for additional drug therapy which occurred as many as 359 (11.6%) incidents, as many unnecessary drug therapy as 247 (7.9%) incidents, ineffective drugs as many as 120 (3.8%) incidents of DRPs, too low doses were 1.041 (33.6%) incidents of DRPs, too high doses were 796 (25.7%) incidents DRPs, adverse drug reactions were 282 (9.1%), non-adherence was 253 (8.1%) incidence of DRPs.¹⁶

The result analysis of (Dempsey *et al.*, 2017) in the *Journal of Pharmacy Practice* showed a total of 304 DRPs with 5 categories of DRPs. The first category is the need for additional therapy which occurred in as many as 37 (43%) incidents, with one of the incidents where 3 patients who experienced insomnia had documented complaints that these patients had sleep disability in the last month, but these patients were not given therapy. In the second category, 17 (35%) drug doses were too low, namely the use of metformin drugs that were not following the guidelines so that they did not reach the target targets related to HBA1c. In category 3, the drug dose was too high which occurred in 9 events (13%), for example, the administration of high doses of digoxin, in the guideline's digoxin is a drug with a narrow therapeutic index. So it needs special attention because if the dose is too high it can cause toxic effects. Category 4 adverse drug reactions were 93 (77%), with an example of one patient experiencing dry cough as a side effect of lisinopril administration. The next category is the category of interactions that occur as many as 90 events (58%) with an example of an incident that is the administration of

loop diuretic therapy used together with warfarin which causes an increased risk of bleeding, the concomitant use of angiotensin-converting enzyme inhibitors, and aldosterone antagonists can increase the risk of hyperkalemia.¹⁷

The research of (Armor, Wight and Carter, 2014) showed that there is an incidence of DRPs, the need for additional therapy as much as 19 (15.3%), unnecessary therapy as much as 2 (1.6%), adverse drug reactions as much as 1 (0.8 %), there were 22 (17.7%) non-compliance problems. So the results show that the problem with drug therapy is the problem of non-compliance followed by the need for additional therapy.¹⁸

The result analysis of (Westberg *et al.*, 2017) in the *Journal of Pharmacy Technology* showed that there are 3 categories of DRPs. There were 121 (11.7%) cases of unnecessary drug therapy, with one of the occurrences being the use of a combination of two drugs, namely terazosin and tamsulosin. The use of a combination of the two drugs can potentially result in hypotension or low blood pressure. The next category is the category of adverse drug reactions that occurred in 141 (13.6%) events, in which the use of drugs involved in this therapeutic problem is antidiabetic agents, antiplatelet agents, and cardiovascular agents. The next category is the non-adherence category which occurred as many as 147 (14.2%) incidents, for example, the patient did not adhere to the use of a tiotropium inhaler, the non-adherence occurred because the patient did not understand the instructions given. So that non-compliance can have a bad impact on patients.¹⁹

The research was conducted at the Cimma University Hospital for patients aged 18 years and over and who had complete medical records. The study found that there were 104 patients with heart failure who had at least 1 DRP. Of these, 45.5% needed additional drugs, noncompliance (22%), inappropriate dosing (9.3%), ineffective drugs (8 , 2%) and adverse drug reactions (6.0%). Patient suffered from a large number of drug-therapy problems. Drug with survival benefits were underused²¹.

The Pharmaceutical Care Network Europe (PCNE) created guidelines and classification of DRPs to describe DRPs uniformly and used them as process indicators in experimental studies. This association was founded in 1994 by several pharmaceutical researchers from Europe.^{22,23} Many studies use PCNE DRP to detect DRP characteristics. A study conducted on patients with cardiovascular disease at the University Hospital of Gondar, Ethiopia, found that out of 227 patients there were 265 DRP. The types found based on the PCNE classification were inappropriate drug selection (36.1%) and dosage (24.8%).²⁴ Another study conducted at a teaching hospital in the city of Nitra, Slovakia, found that out of 73 patients at the cardiology clinic there were 36 cases of DRP. The most common problems were dose (26%) and use related.²⁵ A study conducted at a university hospital in Cyprus to introduce clinical pharmacy services to cardiovascular clinics found that out of 133 patients reviewed, 81 patients had DRP. A total of 93.1% of the 432 pharmacy interventions were well received. Based on the PCNE DRP V6.2 classification, the main problem found from 217 patients was the treatment effectiveness (P1) of 49.3%. The cause of DRP based on the PCNE DRP V6.2 classification, from 263 cases, the main cause of the problem was drug selection (C1), which was 44.9%. The most recommended intervention of the 432 cases was the

solution at prescriber level (I1), namely 50.9%. The most outcomes based on the PCNE classification were problem totally solved (O1), namely 78.8%²⁶.

Coming out of the 8 categories of DRPs identified from the 14 journals, it shows that the management is not optimal so that there need to be improvements in the management of DRPs such as giving or recommending interventions such as stopping drug therapy, providing drug information, drug change, initiation of new drug therapy, dose reduction, dose increase, change in drug formulation.¹⁴ With the existence of recommended management interventions, it can overcome the incidence of drug therapy problems and save costs in patients. Positioning Pharmacists in all areas of care allows them to make many recommendations directly to patients and their fellow physicians to prevent harm and to optimize clinical outcomes in the patient population.

Pharmacists also provide services such as drug reconciliation in care transitions, chronic disease education, reminder devices, and recommendations for changing dosage forms. Meaningful interventions like these are made possible by Pharmacists to increase access to the care process for patients with incident drug therapy problems while freeing up doctors and other staff to care for other patients.

Management in governing drug related problems:

1. Medication therapy management (MTM). Medication management services should optimize therapeutic outcomes by identifying and resolving drug therapy problems. MTM intervention also reduces the risk of hospitalization and also reduces the cost of hospitalization stay. These results found the mean number of inpatient visits was lower for patients who received MTM (compared to patients who refused MTM)²⁰

2. *The Pharmacist-led Interventions on Transitions of Seniors* (PIVOTs). These pharmacists carry out comprehensive medication management on an ongoing basis to fill in care gaps that are often missed in today's health care system. Although many patient-pharmacist appointments involve regular follow-up (e.g., annual health visits), many of these meetings occur when the patient switches from one location to another, including follow-up discharge from hospitalization, comprehensive drug review of admission to nursing facilities, and when patients move from their home to a life support facility.

CONCLUSION

Based on the review results of 14 articles, there were 8 incidents of drug related problems (DRPs). From the results of the review it can be concluded that of the 8 categories of DRPs, the category that most often appeared or identified was the category that needed additional therapy which was found in 12 articles. While the category with the highest percentage is the problem of drug interactions, it can be seen from the 6 articles stating that the interaction category is the highest category of each of these articles.

Because these problems indicate that the management of DRPs is still not optimal, so it has a negative impact on patient care outcomes. Therefore, there is a need for improvement in the management of DRPs governance. This improvement requires special attention and cooperation of health professionals, one of which is by including pharmacists in a multidisciplinary team. Pharmacists are optimally positioned to identify, resolve, and prevent drug therapy problems (DRPs).

SUGGESTION

Direct testing should be carried out in the form of a descriptive observational study with prospective data collection to determine the percentage of drug related problems and management of drug related problems in patients with congestive heart failure.

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