



## Drug Information Services by Pharmacist and Patient Compliance in Drug Use

1<sup>st</sup> Kusumaningtyas Siwi Artini  
Pharmacy Departemen, Faculty of Health Science  
Duta Bangsa University  
Surakarta, Indonesia  
[kusumaningtyas@udb.ac.id](mailto:kusumaningtyas@udb.ac.id)

2<sup>nd</sup> Tommy Julianto Bustami Effendi  
Faculty of Pharmacy Universiti Teknologi MARA  
Puncak Alam, Selangor, Malaysia  
[tommy@uitm.edu.my](mailto:tommy@uitm.edu.my)

3<sup>rd</sup> Weri Veranita  
Pharmacy Departemen, Faculty of Health Science  
Duta Bangsa University  
Surakarta, Indonesia  
[weri\\_veranita@udb.ac.id](mailto:weri_veranita@udb.ac.id)

4<sup>th</sup> Muladi Puta Mahardika  
Pharmacy Departemen, Faculty of Health Science  
Duta Bangsa University  
Surakarta, Indonesia  
[muladiputra@udb.ac.id](mailto:muladiputra@udb.ac.id)

5<sup>th</sup> Anita dwi Septiarini  
Pharmacy Departemen, Faculty of Health Science  
Duta Bangsa University  
Surakarta, Indonesia  
[anitadwi098@udb.ac.id](mailto:anitadwi098@udb.ac.id)

6<sup>th</sup> Ema Ananda Perdana  
Pharmacy Departemen, Faculty of Health Science  
Duta Bangsa University  
Surakarta, Indonesia  
[Emaananda877@gmail.com](mailto:Emaananda877@gmail.com)

### ABSTRACT

*The development of technology make it easier for people to obtain health information, including information of pharmaceutical. The development of information system is like a double-edged knife, on the one hand it provides good opportunities for easy access to drug information, but on the other hand, it can harm patients because the information is not accurate. Today, people can buy drugs online and used them without a pharmacist's direction and it can increae the risk of drug abuse. In following the devolopment of this information system, pharmaceutical services must be improved by improving the information system and improving drug services by pharmacist. Pharmacists carry out direct pharmaceutical services including drug information services to patients in the hope that they can guarantee rational, safe and effective treatment. Drug information service (PIO) is the activity of serve and providing information, independent, accurate, comprehensive, up-to-date drug recommendations by pharmacist to patients or people in need. The purpose of this study was to determine the role of pharmacists in providing drug information to patients. This research was conducted using a systematic review method from several research journals on drug information services by pharmacists. The result of this study are descriptions of drug information received by patients.*

**Keywords:** *informatin system, pharmacist, drug information services*

### I. INTRODUCTION

Nowadays, the development of technology and information is very fast. Technological development makes it easier for people to obtain health information, including pharmacy information. The development of this information system is like a double-edged knife, on the one hand, it provides good opportunities for easy access to drug information, but on the other hand, it can harm patients because the information received is not accurate.

Today, people can easily buy a drug online and use them without a pharmacist's direction and the chances of drug abuse are very high. In following the rapid development of this information system, pharmaceutical services must be improved by improving the information system and improving drug services by pharmacists. Pharmacists carry out direct pharmaceutical services including drug information services to patients in the hope that they can guarantee rational, safe, and effective treatment.

Drug information service (PIO) is one of the pharmaceutical duties, which is defined as

the activity of provide information, recomend drug independently, accurate, comprehensive, up-to-date by pharmacists to patients, the public, or those in need. Drug information services include the provision, processing, presentation, and quality control of drug data and information and professional institutions. In carrying out drug information services, pharmacists can carry out activities that include communicating with patients and either actively or passively, providing accurate information to patients, and educating patients regarding drugs and their medication.

Drug information services, especially those related to drug use, are one of the pharmacists' duties to convey accurate and unbiased information to other health colleagues and the public to increase public trust in pharmacists. Based on data from the WHO (World Health Organization), approximately 50% of all drug prescriptions are inappropriate for drug use and the other 50% of drugs are not used properly by patients. The public's lack of understanding of the drugs used will increase drug misuse.

With this problem, pharmacists are required to be able to fill the public's need for drug information so that the role of pharmacists needs to be increased. The purpose of this study was to determine the role of pharmacists in providing drug information to patients so that patient adherence to treatment increases.

## II. RESEARCH METHODS

### A. Data Source

In this study, data that are used are related journals from google scholar and PubMed, both in English or Bahasa. In tracing articel, a search method is needed that can provide accurate data regarding drug information services by a pharmacist and patient compliance with their medication. The search was carried out through Google Sholar and PubMed online sites. Search

articles using keywords like pharmaceutical care-drug information services-pharmacist-patient compliance. The inclusion of this literature review are the articles published 2014-2020, both in English or Bahasa, full-text articles, and the exclusion in this study were articles that published before 2014.

### B. Analysis and Synthesis of The literature

Based on the literature tracing that had been done, the article was checked. An article was carried out through Google Scholar and PubMed using several keywords so that the following results were obtained:

**Table I.** Result of Tracing

Key word	Database	Result
Drug Infomation Services AND Pharmacist AND Patient Compliance	Google scholar	1660
	pubmed	65
Pharmaceutical care AND Drug Information Services AND Pharmacist AND Patient Compliance	Google scholar	1360
	pubmed	76

The next step is to select articles according to the research, articles are reviewed to select articles based on inclusion and exclusion criteria. Articles that compatible to inclusion criteria are then identified by reviewing the title and abstract and the research content that is appropriate and by the research. At this stage, there are 9 articles following this research.

### C. Data Analysis

In this process, the selected articles are reviewed.

**Table II.** Result of review articles

Author	Title	Research Method	Result
Tumiwa, Novita <i>et al</i> (2014)	<i>Drug Information Service on Compliance with Griatri Patients Taking Medicines at the Hospital's Inpatient Installation. PROF. Dr. R.D. Kandou Manado</i>	Descriptive	Providing drug information services by pharmacists affects patient compliance (96%)
Asmini, Puji, <i>et al</i> (2014)	Evaluation of the Effect of Providing Drug Information by Pharmacists on Outpatient Compliance with Type 2 Diabetes Mellitus at RSUD DR. Moewardi Surakarta	Observational descriptive using pretest-posttest design	Providing drug information by pharmacists effects on diabetes patient compliance at Dr. Moewardi, Surakarta (p=0,000 ((p<0,005)))
Dewanti, Sri W, <i>et al</i> (2015)	The Effect of Counseling and Leaflets on Self-Efficacy, Compliance with Medication, and Blood Pressure of Hypertension Patients at Two Public Health Centers in Depok City	Experimental with the provision of counseling and leaflets in the hypertensive patient group	Providing counseling and leaflets is effective in increasing self-efficacy and patient medication compliance
Dewi, Melani <i>et al</i> (2015)	Effect of Pharmacist Counseling on Hypertension Compliance and Control of Prolanis Patients at the Mitra Husada Kendal Clinic	Experimental by providing counseling to respondents	Counseling has an effect on the compliance level of taking medication for hypertensive patients
Sagala, Radoti M <i>et al</i> (2017)	Evaluation of the Application of Booklets and Pharmacist Education in Type 2 Diabetes Mellitus Patients at the Mayapada Hospital, Tangerang	Experimental using a questionnaire	Providing booklets accompanied by education by pharmacists increases knowledge and behavior of self-management

Galistiani, Gita Fungie <i>et al</i> (2018)	The Effect of Pharmacist Counseling on Independent Care Management and Compliance with Hypertension Patients Taking Medication in Puskesmas Purwokerto Region	Observational with pretest-posttest	Pharmacist counseling at health centers is able to improve self-care management and compliance with hypertensive patients taking medication (p=0,000 (p<0,005))
Yuliana, Vera, <i>et al</i> (2019)	The Effects of Pharmacist Counseling on Compliance with Medication and Quality of Life for Schizophrenics at Menur Mental Hospital, Surabaya	Quasi experimental one group pretest-posttest design that is prospective	Providing counseling by pharmacists has an influence on the level of adherence to taking medication in outpatient
Pare, Maria H, <i>et al</i> (2020)	Correlation between Drug Information Services with the level of compliance of hypertensive patients at the Beru Health Center, Sikka district	Non-experimental with a prospective approach with a descriptive design	There is a significant relationship between drug information services and hypertension patient compliance (p =
Wibowo, Much Ilham N, <i>et al</i> (2020)	The Effect of Counseling and Medication Reminder Aids on Compliance with Medication and Clinical Outcomes for Diabetes Mellitus and Hypertension Patients		The intervention given has an effect on increasing medication adherence and can control the clinical outcome of type 2 DM patients and hypertensive patients at the health center (p 0,000 < 0,05)

### III. RESULT AND DISCUSSION

After going through the selection process, 9 articles were obtained that matched the inclusion and exclusion criteria. All articles are taken and used as references in this review article to discuss drug information services by pharmacists and patient compliance related to the medication that

is being undertaken after receiving information about drugs from pharmacists. Drug information services are provided to both outpatients and inpatients with various illnesses.

Based on research conducted by Tumiwa (2014), it is known that the research descriptive method used in this research, with a total of 50 respondents. The research conducted in April to August 2014. From the results of this study it can be seen that some 94% of respondents obtained information about how to take medicine properly and correctly, 76% of respondents received information about diseases that were not informed by doctors and 29% of respondents said that officers willing to provide information and counseling if needed. Geriatric patient medication adherence greatly affects the success of treatment therapy. Therefore, pharmacists must maximize their role in providing education to patients so that adherence and therapy success can be achieved.

The research by Asmini (2014) used a descriptive observational method, by providing a pretest-posttest design. Data were collected prospectively from June to August 2014 involving 90 respondents. Respondents were grouped into 2 groups, one group received leaflets only and the other one received leaflets and counseling by pharmacists. To assess respondents' compliance, the Morisky Medication Adherence Scale (MMAS) questionnaire was used, which was then processed using the Wilcoxon test.

The results of the respondent's level of compliance test with the Wilcoxon test showed a difference between the first (pretest) and second (posttest) visits. From the results of data analysis, it is known that there is a significant difference in the level of adherence  $p = 0.001$  ( $p < 0.05$ ) after giving drug information with leaflets.

Dewanti (2015) conducted a study using a quasi-experimental method which was conducted in March to June 2013, involving 73

respondents. Respondents were grouped into 2, namely the group of respondents who received counseling and leaflets and groups that only received leaflets. For adherence assessment using the MMAS questionnaire. From the tests that have been carried out It can be seen that the group of respondents who either received counseling or leaflets experienced a significant increase in self-efficacy ( $p = 0,000$ ), medication adherence ( $p = 0,000$ ), and decreased blood pressure ( $p = 0.010$ ).

Counseling is a way to increase patient knowledge regarding the diseases and drugs they receive. Providing counseling makes it easier for pharmacists to identify any drug-related problems and find alternatives to overcome these problems so that patients adhere to safe and correct treatment. 77% of patients stated that counseling was useful and 22% stated that counseling was very useful in providing knowledge to patients [1].

A Leaflet is a counseling medium that makes it easy to provide information to patients. Increasing patient knowledge will increase patient awareness of the disease and the risk of complications that can arise so that patients will become adherent to their treatment and the patient's quality of life will be better. Besides, other factors that affect patient adherence, including the number of drug regimens received by patients, poor communication between patients and health professionals, social support, and financial problems. Counseling intervention by pharmacists can affect on increasing patient understanding so that patients can better control systolic and diastolic blood pressure [2].

Counseling by pharmacists provided a significant difference between the level of patient adherence before and after undergoing counseling in hypertensive, hypertensive patients with DM or hypertension with other comorbidities ( $p = 0.015$ ;  $0.025$ ;  $0.009$ ) [3]. Health counseling can improve adherence as



measured by the MMAS-8 questionnaire and decrease the patient's blood pressure [4].

Melani (2015) conducted research using a quasi-experimental method (control group design with pretest-posttests). Data were collected from November 2013 to January 2014 involving 55 respondents. Respondents were grouped into 2 groups with different treatment. Assessment of patient adherence using the MMAS questionnaire. From the tests that have been done, it is found that counseling by pharmacists affect on medication adherence in hypertensive patients. This is following previous research, namely an increase in hypertension patient compliance after undergoing counseling by pharmacists at Undata Hospital Palu [5].

Sagala (2017) conducted a study on evaluating the application of booklets and pharmacist education in patients with type 2 diabetes mellitus at the Mayapada Hospital, Tangerang with an experimental method using a questionnaire. This research was conducted from November 2015 to December 2015 involving 90 respondents in which respondents were divided into 3 groups consisting of groups that received booklets and intervention, groups with booklets, and control. Data were obtained by using the independent sample T-test and to see the relationship between knowledge, compliance, and blood insanity, the Pearson test was performed.

From the research, it was found that the provision of booklets and education by pharmacists to the respondents increased their knowledge ( $p = 0.02$ ) and self-management behavior ( $p < 0.01$ ) than the group that only received booklets.

Galistiani (2018) conducted a study aimed at assessing the effect of pharmacist counseling on the success of hypertension patient therapy with parameters of self-care management and medication adherence. The research was conducted using observational methods with pretest and posttest. The research

was conducted from January to March 2018 with 42 respondents. From this study, it was found that there was a significant relationship between pharmacist counseling and self-care management ( $p < 0.05$ ), and 76% of respondents adhered to the treatment.

Yuliana (2019) conducted a study using a prospective one-group pretest-posttest method. This research was conducted from May to July 2018 at Menur Mental Hospital Surabaya. This study involved 100 respondents. The instruments used were the Medication Adherence Rating Score (MARS) questionnaire to assess the compliance of respondents and The World Health Organization Quality of Life (WHOQOL) - BREF questionnaire for quality of life which has been translated into Indonesian. The data obtained were then analyzed using the Kolmogorov - Smirnov normality test and continued with the t-test.

This study proved that counseling by pharmacists had a significant effect on medication adherence and quality of life for people with schizophrenia ( $p = 0.03$  ( $p < 0.05$ )). These results are consistent with a study conducted by Mishra et al (2017) that directly involving pharmacists in a schizophrenia patient care team in India can help improve patient medication adherence and quality of life [6].

The research conducted by Pare, Maria et al (2020), was conducted at the Beru health center, Sikka district in the period May - June 2019. This research used the total- sampling technique in determining the number of samples. With this method obtained a sample of 42 people. The research data were collected using a checklist and a questionnaire given to the patient simultaneously. The data obtained were then analyzed using Kendall's tau correlation test.

Drug information service (PIO) is one part of standard pharmaceutical services that must be implemented by pharmacy. Pharmaceutical service is a form of responsibility and direct

service of the pharmacist profession in carrying out pharmaceutical work to improve the quality of life of patients. This pharmaceutical service aims to identify problems related to drugs and other health problems.

Drug information services are carried by Permenkes No. 74 of 2016 concerning Pharmaceutical Service standards where pharmacists must provide clear information about the drugs received and used by patients including drug names, drug dosages, how to use, indications, storage methods, and possible side effect arose.

In this study, data was obtained that the pharmacist had just conveyed information to the patient regarding the name of the drug, the dosage of the drug, and how to use the drug. This occurs due to obstacles in conveying drug information to patients, one of which is due to the limited number of pharmaceutical personnel at the health center so that officers have to work quickly so that the drug service process takes place quickly and also because there are no pharmacists at the Puskesmas.

Patient adherence level data were obtained using the Morisky Medication Adherence scale (MMAS) 8th edition of the questionnaire, the results obtained were 22% adherent to the treatment. The next aspect discussed in this study is the correlation between Drug Information Services and the compliance level of hypertensive patients. The data obtained were analyzed using Kendall's tau analysis method.

From the analysis results obtained p-value = 0.031 ( $p < 0.05$ ), which means that there is a significant relationship between drug information services and compliance with hypertensive patients. According to Putriani (2014), drug information services are very important in increasing the success of hypertension therapy.

The research conducted by Wibowo (2020), was held on February to May 2019 at Prolanis Puskesmas Kembaran I, Puskesmas Purwokerto

Timur II, and Puskesmas Sumbang I with a sample of 66 patients with type 2 diabetes and 72 patients with hypertension. Sampling was done by a total sampling method and for the pretest and post-test groups based on the simple random sampling method.

To measure adherence using the MARS questionnaire which has been translated and declared valid and reliable to be used to measure the level of patient medication adherence with a Cronbach alpha value of 0.803 [7]. The instrument used for counseling is the standard guideline for pharmaceutical counseling issued by the Directorate of Pharmaceutical and Medical Devices in 2007 [8]. This guideline contains a checklist of counseling activities to be given to selected respondents which are carried out simultaneously to avoid bias. For a reminder aid, The treatment in this study was an independent medicine card issued by the Directorate of Pharmaceutical and Medical Devices in 2007 [8].

From this study, a sociodemographic picture that describes the characteristics of the respondent includes gender, age, occupation, education, medicine, IBM, and family status. Besides, it is also obtained an overview of medication adherence in type 2 diabetes patients and hypertension. This data is based on the questionnaire given to the respondents. Based on the data obtained, the level of patient compliance was divided into 2, namely adherence and non-compliance. There were differences in results before the pretest and after post-test. After the post-test was given, the respondents experienced an increase in compliance after being given the counseling intervention.

Disobedience of Diabetes Mellitus patients is influenced by several things, including being too busy with activities so that they forget to take medication, run out of medication, feel healthy so they do not need to take medication [9]. The therapeutic success of Diabetes Mellitus patients



can be improved by providing pharmaceutical residential services [10].

Providing counseling for DM and hypertension patients shows a p-value of  $0.000 < 0.05$ , so it can be concluded that there are significant differences before and after being given counseling about their treatment. Providing counseling to respondents or the respondent's family will be able to increase the knowledge, understanding, and awareness of the patient and the patient's family [11]. Besides, counseling can also increase a positive attitude and treatment compliance in hypertensive patients, thereby increasing the patient's confidence to routinely seek treatment and control their blood pressure routinely [12]

Providing counseling with medication reminders to reduce clinical outcomes showed a p-value of  $0.000 < 0.05$ , which means that there was a significant difference in clinical outcome values before and after the intervention was given. Pharmaceutical services performed by pharmacists for type 2 Diabetes Mellitus patients can increase patient compliance in using drugs so that therapeutic success can be achieved [13]. From the research, it can be seen that the provision of counseling with medication reminders is more influential in increasing patient adherence to treatment compared to counseling interventions alone.

#### IV. CONCLUSION

There are nine articles that discuss the effect of drug information services by pharmacists on patient compliance in their treatment with a total number of respondents as many as 638 respondents. The results of the study of the nine articles indicated that drug information services affected patient adherence during treatment. To get the success of treatment therapy, cooperation between health workers is needed in educating patients to be disciplined in carrying out their medication.

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