

Printed Material Model as a Drug Information Services For Patient Refer-Back in National Insurance of Health (Indonesia)

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ABSTRACT

Background: Each drug has a dose, administration, frequency, even different usage times. and need to be correct usage information. The incorrect usage can reduce its effectiveness even can make it more dangerous general, when dispensing at the pharmacy, the provision of information is made by writing simple rules of use called the label and is equipped with a little verbal information. Moreover, this may not be remembered by the patient if the patient receives many items of medicine. The Aim of study :It has been designed by providing posters and brochures of some diabetes drugs that are often used in National Insurance of Health (JKN) participants to measure the blood glucose level before and after an intervention. **Methods** This is intervention research with pre and post-test group designs. Thirty respondents received oral anti-diabetes or injections without comorbidities. The assessment is carried out on the respondent's knowledge and its impact on the blood glucose level. The printed material model is given in A4 size poster and smaller size brochure according to the name of the drug received by the patient. The impact of providing printed information on respondents' knowledge was measured with the t-test, comparing before and after being given an intervention . The results: After 30 days later intervention, showed significant differences ($p < 0.05$) in knowledge and blood glucose levels of respondents have lowered before and after being given posters and drug information brochures.

Conclusion: providing adequate drug information through printed materials can improve knowledge and positively impact people's blood glucose levels with diabetes.

KEYWORDS: drug information, brochures, diabetic , intervention.

I. INTRODUCTION

The provision of drug information to patients based on writing by the pharmacy is given through an etiquette or label when delivery of drugs requested by prescription. A label is a small piece of paper that contains a little information such as the rules for using drugs (taken before or after meals), the frequency of use (how many times in a day), and also the doses (one teaspoon, one drop or other doses). This etiquette helps the patient use the medicine according to the doctor's rules in the prescription. However, the other information is still needed to support drug use accuracy, especially for people with chronic diseases that have not been listed on the label. Pharmacists have a strategic position in drug use because it can explain the efficacy of treatment, safety, and lifestyle that patients must live. This was stated in a 21 referrals review that wrote about a collaboration between pharmacists and nurses in improving patient compliance [1]. However, not all pharmacists do their part correctly to improve patient compliance.

In general, drugs are delivered by a Pharmaceutical Technician (PT) who works to help pharmacists. When delivering medicine, they usually communicate with a patient or their family or read out the drug label's information. PT has limitations in knowledge and authority in providing information about the drug. Surabaya's study showed that the drug information given to patients was mostly about taking medication (60.3% and 64.7%), the time to use the drug (12.8% and 12.9%), and the number of drugs used for medication. Each use (7.7% and 30.6%). The information is already written on the label, while other information beyond that is not provided. This study was conducted explicitly for respondents who were prescribed metformin and glibenclamide [2].

On the other hand, there is some information needed by patients so that the resulting therapeutic effect can be more optimal because patients need information about the rules of use and other things related to the drug.

According to the Regulation of Minister of Health No.73/ 2016, information can be provided by answering questions, orally, or in writing [3]. It can also be done by distributing bulletins, brochures, or leaflets and providing counselling . A study of 14 people with type 2 diabetes mellitus who were given information orally, given brochures, and reminded by sending short messages proved to improve blood glucose levels by 16.01% and improve HDL levels by 6.73%. [4].

Pharmaceutical manufacturers have included drug information brochures in their drug packaging, but these brochures are rarely given to patients. Brochures from the pharmaceutical industry may be too difficult to understand because there are still pharmaceutical or medical terms that are difficult for the average patient to understand. In some studies, it is proven that brochures can improve understanding of something. A study on the effectiveness of brochures was once conducted. The respondents were families of chronic disease patients who had critics. They were given brochures to understand the condition of patients with critical and consequent chronic illnesses. As a result, their understanding improved after reading the brochure stipulated. [5].

For this reason, a written information model was created in the form of a simple, informative, and practical brochure. This brochure can be submitted by TTK when delivering drugs to patients to complete drug information, especially for patients with chronic diseases such as diabetes who use drugs for an extended period.

II. MATERIAL AND METHODS

This type of research is intervention research with a pre and post-test group design. The respondents were JKN participants who received oral and injection anti-diabetes drugs without comorbidities of 30 participants. The assessment was conducted on the respondent's knowledge and its impact on the respondent's clinical indicator, namely the respondent's blood glucose level. The printed material model provided is a brochure containing information related to diabetes drugs and a brochure for each drug, namely diabetes medication received by patients. The impact of providing printed information on respondents' knowledge was measured using the t-test, before and after the intervention. The next step is to measure the blood glucose level of each group.

III. RESULT

The development of a printed information model in brochures was tested on diabetic patients who were JKN participants and took their medicines at several pharmacies in collaboration with BPJS Kesehatan in Palembang. The brochure was shared by TTK when the patient took medicine to the pharmacy. Previously, patients who were respondents had their blood glucose levels measured and their knowledge identified.

A. Respondents' Knowledge before the Distribution of Brochure

The questionnaire is made in the form of a right or false statement. Several statements were made incorrectly in order to avoid respondents choosing answers arbitrarily. The data presented describe the percentage of correct or correct answers for each item of the statement. Details are presented in the following table.

TABLE 1. KNOWLEDGE OF ORAL DRUGS DIABETES RESPONDENTS BEFORE BEING GIVEN A BROCHURE

No	Statement	Correct Answer (%)
1	Uncontrolled high blood glucose levels can cause complications	27
2	Diabetes medicine must be taken even though the blood glucose level when checking is within normal limits	27
3	There are diabetes drugs that cause gastrointestinal side effects, so they are recommended to be used after meals	66
4	People with diabetes are advised to have their kidneys checked regularly at least once every three months	16
5	Oral diabetes medications should be swallowed using boiled water	83
6	Diabetes drugs that have rules for use before meals should be used thirty minutes before meals	83
7	One of the symptoms of hypoglycemia is palpitations	11
8	Taking diabetes medications can cause drug dependence	11
9	Oral diabetes medications can be stored / placed in a place exposed to sunlight	16
10	The number of carbohydrates eaten affects blood glucose levels	83

Tabel 2. KNOWLEDGE OF DIABETES DRUG INJECTION RESPONDENTS

No	Statement	Correct Answer (%)
1	Injectable antidiabetic drugs are substitutes for insulin	75
2	Injectable antidiabetic drugs are injected regularly according to the dosage	75

	recommended by the doctor	
3	Used syringes can be thrown in the trash	25
4	Injecting Novorapid long before meals can result in hypoglycemia	25
5	One of the characteristics of hypoglycemia is that the hands and feet feel stiff	0
6	The drugs Levemir and Lantus are injected at the same time every day	58
7	After being used, the injection drug must still be stored in the refrigerator (2-8° Celsius)	0
8	The injection location does not need to be moved, it can be done in one place continuously	83
9	Syringes should ideally be used only once	0
10	After being used, injectable drugs can still be used after three months, if they have not run out	83

Drug Information Service is one form of clinical pharmacy service at a pharmacy. The implementation must be supported by the availability of pharmaceutical resources, facilities, infrastructure, and human resources oriented to patient safety [5]. Besides, there is a pharmaceutical technician who helps pharmacists in carrying out their duties, providing information that should be provided by pharmacists. However, if there is only one pharmacy pharmacist, this drug information service activity will also not run optimally. If the patient is not informed well, this will affect their knowledge.

B. Development of Print Materials

The printed material is presented in the form of a brochure, which contains the following information.

FOR ORAL DIABETES MEDICINE

1. Controlled blood glucose levels can prevent complications, namely heart and blood vessel disorders, kidney, eye, and nerve disorders, therefore take medication regularly and always on time.
2. Drink medication irregularly, sometimes they drunk but sometimes stops causing sugar levels to be uncontrolled; it accelerates complications
3. Diabetes drugs are generally taken 30 minutes before meals because the results will be maximum; it is useless if taken after meals.
4. There are also drugs that are taken with food to prevent more carbohydrates from being absorbed.
5. For drugs that are taken simultaneously as food, swallow the medicine with boiled water after the first bite, then continue eating as before.
6. Specifically for Metformin, it has been used after meals to reduce the risk of gastrointestinal disorders such as diarrhoea.
7. The head can get dizzy after taking medicine because there is a decrease in blood glucose levels, but for a long time, they will get used to it
8. The drug acarbose can cause diarrhoea or fart, but if you do not feel disturbed, the drug can be continued because the condition will return to normal after getting used to it. However, if you feel uncomfortable, ask your doctor to prescribe another medication.
9. Acarbose is taken before meals because it works to inhibit the absorption of starch or sugar from food. This medicine is less effective if taken after meals.
10. Kidney health needs to be checked in the laboratory at least every six months after using diabetes drugs.
11. Do not forget to exercise or do physical activity for at least 30 minutes every day, keep the food balanced, avoid eating much starch, and increase the fibre from vegetables and fruits that are not too sweet.
12. Store the medicine in a cool and dry place, do not expose it to sunlight and heat.
13. Pay attention to the expiration date of the drug.

FOR INJECTION DIABETES MEDICINE

1. The usage of injection (insulin) is to control blood glucose level that increases while eating
2. Insulin is not narcotics, so the usage is not caused by drug dependency.
3. An injection is happened before eat with short-haul time from eating time to avoid hypoglycemia (the symptoms are weakness, trembling, and dizzy eyes)
4. Do the injection with the right dose according to the doctor's instruction.
5. For injectable drugs used at night (for example, Levemir or Lantus), it is recommended to inject at the same time every night, for example, every nine at night.
6. Syringes for insulin should only be used one time; use a new syringe for the next injection.
7. If the medicine does not flow, it may be a blockage at the tip of the syringe; this is because there is insulin drying at the tip of the needle, so the needle must be replaced.
8. The best conditions are injecting and eating at the same time every day.

9. When the sugar levels are under control, let the doctor know to readjust the insulin dose you are using.
10. Insulin medicine that has been used does not need to be stored in the refrigerator; its use is effective for 28 days. After that, even if there is still anything left, it should be discarded.
11. Dispose of used insulin syringe by burying them in the ground. If this is not possible, you can collect them and hand them over to a pharmacy or Primary Health Care for medical waste disposal.

The printed material model that was made next was a drug brochure, namely the drug metformin, glimepiride, acarbose, fast-acting insulin (Novorapid), and long-acting insulin (Levemir). This brochure design is simple, lightly coloured to attract people to read it. Brochures were given according to the medicinal items used by the respondents.

This brochure's distribution does not intend to replace the pharmacist's role in providing oral information directly during drug delivery. However, it is intended to complement and remind patients always to be obedient to using the medicine. Drug information is a patient's need because if the patient gets the correct information, they will use the information for his health.

After the brochure is given when the patient picks up the drug at the pharmacy, a few days later, a knowledge measurement is taken by distributing the same questionnaire used before the distribution of the brochure. It was done to assess the impact of the brochures provided. Measurement of diabetes respondents' knowledge was carried out pre and post-test without a control group because the number of respondents was few. There is no difference in treatment for patients who receive oral drugs or injection drugs because what is checked is the sugar content. The results are as follows:

Table 3. DIABETICS RESPONDENT KNOWLEDGE BEFORE AND AFTER DISTRIBUTION OF BROCHURES

No	Category	N	Asymp. Sig
1	Drugs Oral	18	0.000
2	Drug Injection	12	0.002

Because the number of diabetes respondents without comorbidities is small, the data distribution is not normally distributed; therefore, a two-related sample test of the Wilcoxon Method was used. The results show that H_0 is rejected (Asymp.siq. 0.000 for oral drugs and 0.002 for injection drugs), meaning that there is a difference in knowledge before and after giving brochures. The provision of brochures in this study is statistically proven to increase the knowledge of the respondents.

C. The impact of knowledge on blood glucose levels

In addition to measuring knowledge, to assess the impact of increasing knowledge after the respondent received the drug information brochure, a diabetes respondent measured blood glucose levels. Measurements were made twice, namely at the beginning of the study, before giving the brochure, and at the end of the study, namely three months after giving the brochure. The following are the measurement results.

Table 4. BLOOD GLUCOSE LEVELS OF DIABETICS RESPONDENT DIABETIC RESPONDENT BEFORE AND AFTER BEING GIVEN BROCHURES

Measurement	Gucose blood level (mg/dL)	Standart Devices	Sig
Before being given Brochures	219,37	80,309	
After being given Brochures	199,03	76,801	0,000

There was a significant difference in blood sugar levels before respondents received the brochure compared to their average blood sugar levels after receiving and reading the brochure. Clinically the average blood sugar level is currently still above normal sugar levels. The standard deviation is quite large because the respondent's blood sugar level variation is also quite considerable. The spread of respondents' blood sugar levels ranged from 145 - 457 mg/dL in the initial measurement to 138 – 425 mg/dL in the next measurement.

Good knowledge does not necessarily change behaviour for good because several factors influence behaviour, such as economic circumstances, environment, culture, and habits. One of the correct but intricate knowledge followed by respondents is the use of disposable insulin syringes. The syringe price strongly affects this since the syringe is not included in the treatment claimed by the PRB pharmacy. Research at a hospital in Porto Alegre, Brazil, showed that 75% of respondents still used recurrent syringes with frequencies from 2 to 21 times [6]. The small number of samples caused the respondent's blood sugar level data to be distributed abnormally, so the testing was conducted on a non-parametric level even though the data type ratio. The standard deviation of sugar levels in this study was considerable because the respondents' variation in blood sugar levels ranged very far from 145 – 457 mg/dL. The measurement of blood sugar levels was taken during the day, 15:00 until 17:00. It was expected that the respondent was about 2 to 3 hours after lunch during that

hour. However, it did not close the possibility of respondents consuming exciting foods. The provision of brochures as a complement to drug

IV. DISCUSSION

In this study, PT did provide information regarding dosage, the rules for use, and how to use the drug, but other information that could affect the accuracy and adherence to therapy was not provided. It can be seen from respondents' answers in the questionnaire; for example, there are still almost 50% of respondents who forgot to take medicine also experienced problems due to drug use. Respondents' incorrect answers indicate their lack of knowledge about matters relevant to their treatment. In Surabaya, a study showed that the most information given was about the frequency of taking medication, time to use the drug, and the least information was the number of drugs for each use [2]. It condition occurs in many places, where the information provided at the time of drug delivery is limited to what is written on the drug label.

If they know that they had to take medication regularly every day because of the risk of increased blood pressure, if they did not take medicine, the patient would be more obedient to taking medicine. A study on the knowledge of paracetamol drug use has been conducted among students from the faculties of medicine, pharmacy, nursing, and physiotherapy. These students are considered to have sufficient knowledge related to medicine because they are health education students. However, it turns out that from 87 respondents, there are still 30% who do not have adequate knowledge [7]. Suppose health students still do not have a good knowledge regarding the drugs they use. In that case, even more, chronic disease patients such as hypertension and diabetes, who do not have a background in health education, and also if they are in advanced age, of course, they have lack of knowledge.

A study about communicating risk was conducted on Health Care Professionals, and the result showed that the group received brochures (86.4% to 96.6%) was able to answer five survey questions more correctly than those who had not (51.5% to 97.0%) [8]. Information brochures that have been designed in such a way have also been proven to be useful in improving the understanding of families of chronically ill patients who are already critical so that they can accept the condition of that critical patient [4].

In some situations, brochures prove useful, although sometimes other media such as video, can become more effective, as was once done in a cross-sectional survey among people with diabetes in Hyderabad related to the behaviour and compliance of conducting diabetic neuropathy screening [9].

In a study of 45 hypertensive patients, 23 people were given information, and 22 people were not; the results caused respondents who were given information to have higher adherence to their drug use [10]. Another study using calculating the remaining medication for diabetic patients showed that 54.35% of respondents were declared non-compliant because they did not finish the drug [11]. Most patients are afraid to take medication every day because they are worried about side effects and dependency effects, as stated by respondents in this study. They do not take drugs as recommended.

Regarding conditions like this, it is necessary to explain to patients that it will be more dangerous for their health if they do not take medicine regularly. Blood pressure can soar and can cause a stroke, while for people with diabetes, uncontrolled blood glucose levels will accelerate the occurrence of complications [12].

V. CONCLUSION

Brochures made simple and equipped with the type of drugs used have increased the knowledge of respondents who use diabetes mellitus drugs. Knowledge severing has a significant impact on blood sugar levels, even if they have not reached normal levels as expected.

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