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Drug Information Services at Primary Healthcare: An Analytic Study of Patient Satisfaction Among Patients with Diabetes Mellitus in Kapanewon Depok Yogyakarta Indonesia

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ABSTRACT

Patient satisfaction with drug information services is an important indicator of health services quality. These services are paramount to diabetes management and ensure the proper use of medications. Essentially, the quality of drug information services affects the satisfaction of patients with diabetes. This study aimed to evaluate the level of satisfaction among patients with type 2 diabetes mellitus regarding drug information services. This observational analytic study used a cross-sectional design. Data were collected using a 21-question questionnaire and interviews based on seven guidelines for providing drug information. The respondents were selected using purposive sampling. The sample population number was calculated using the Slovin formula. Interviews were conducted with pharmacists who provided drug information services. Descriptive statistics were used to analyze the data in this study. Satisfaction analysis in this study used the calculation of the gap between reality and expectations. The respondents were 98 people with type 2 diabetes from Kapanewon Depok Yogyakarta Primary Healthcare who received drug information services. The results indicate that most patients are satisfied with the drug information services at Kapanewon Depok Yogyakarta Primary Healthcare. A dissatisfaction concerning the right medication was found in Depok II Puskesmas.

INTRODUCTION

The Drug Information Services, administered by pharmacists, aim to provide the most recent, lucid, and precise pharmaceutical data to physicians, pharmacists, nurses, other healthcare professionals, and patients (Ministry of Health Republik Indonesia, 2016). This information can be delivered directly through face-to-face interactions or indirectly via telephone, brochures, newsletters, leaflets, and posters (Ramadhani, 2021). By utilizing these services, the appropriate use of medicine can be maximized to achieve optimal therapeutic outcomes, and patients are kept informed. Proper implementation of these services is essential for ensuring high-quality care and enhancing patient satisfaction (Dona, 2020). However, various factors such as insufficient human resources, patient age, service flow, time or workload, as well as inadequate facilities and infrastructure can impede patient satisfaction with drug information services.

Diabetes mellitus (DM) is a global chronic disease resulting from metabolic disorders characterized by high blood sugar (hyperglycemia). It can lead to damage to tissues, organs, kidneys, the nervous system, blood vessels, and muscles. According to data from the International Diabetes Federation (IDF) in 2021, Indonesia ranks among the top 10 countries with highest number of DM cases, with a projected prevalence of 28.6 million by 2045. The

Indonesian Ministry of Health (MoH) reported in 2019 that in the Yogyakarta Special Region, the diabetes prevalence rate is 2.4% of the population, making it the second highest in the country. Specifically, the prevalence of diabetes in Kapanewon Depok is 2.47%, with the Yogyakarta Special Region Health Department recording 2,800 cases. In Indonesia, primary healthcare facilities, known as *Puskesmas*, provide pharmaceutical services, including drug information services.

Patients with diabetes must adopt a healthy lifestyle and manage their blood glucose levels to prevent complications. Self-awareness and increased adherence to medication are crucial for achieving optimal results (Prasetya *et al*., 2023). Pharmacist drug information services are essential to ensure that diabetic patients use their medication properly. The quality of these services affects patient satisfaction. This study aims to determine the level of satisfaction among patients with type 2 DM regarding the drug information services they received at the Kapanewon Depok Yogyakarta primary health care center.

A key element of pharmaceutical treatment is patient satisfaction with drug information services, which makes this research significant. This allows patients to evaluate the quality of care provided at *Puskesmas*, particularly with regard to the appropriate use of medications, which significantly impacts patient recovery. One gap in the literature is the lack of research that has explicitly examined patient satisfaction with drug information services for patients with diabetes mellitus at *Puskesmas*, especially with regard to the seven rights of medication information. Thus, this study aimed to determine the level of patient satisfaction and evaluate the quality of *Puskesmas*' drug information services.

METHODS

This observational analytical study was conducted with a cross-sectional design. Data were gathered using a 21-question questionnaire with five Likert scale answers and through interviews with primary health pharmacists. The purpose of these interviews was to validate the questions in the questionnaire, ensuring that drug information services at the Kapanewon Depok Primary Healthcare are optimally provided. Additionally, the interviews aimed to identify the obstacles encountered when these services were delivered.

The questionnaire used in this study was designed based on the Seven Rights of Medication Information Service Guidelines (Aprilia *et al*., 2022). It consists of six dimensions: right patient, right dose, right medication, timely administration right, right administration method, and right information. Each dimension includes questions derived from previous research (Arfania *et al*., 2022; Rose *et al*., 2023; Sutrisnawati *et al*., 2023; Werawati *et al*., 2022).

Validation tests, such as content and face, were conducted to confirm the questionnaire's validity and make sure it could provide accurate answers for the five-dimension items evaluated. Content validation was performed using the professional judgment of two pharmacists. The first was a primary healthcare pharmacist who had been providing drug information services for 20 years. The second was a community service pharmacist with 15 years of experience in delivering information. Validators were chosen based on a minimum of five years of experience in delivering drug information services since they are proficient in providing those to patients. The validators were given access to the study questionnaire and requested to offer suggestions for enhancements. As verification, the researcher taught suggested responses to the questionnaire to the validators. After making the necessary revisions, the researchers resubmitted the questionnaire for the validators' consideration and approval. Face validity was conducted as a language comprehension test to ensure that the written language in the questionnaire was clear and understandable. Five respondents were asked to complete the questionnaire and to identify any words or sentences they found difficult to understand. The results showed that the wording used in the questionnaire was easily comprehended by the respondents and did not pose any difficulties while they were filling it out. Reliability testing was conducted to ensure that the tools used were dependable and produced consistent results. Thirty research participants who met the criteria were tested. Cronbach's alpha was used to analyze the reliability test results, which showed that the tools were reliable. The reliability test result was 0.826 for expectation component and 0.791 for actual component.

The Slovin formula was used to determine the minimum sample size.

$$n = \frac{N}{1 + Ne^2}$$

N = population number (Yogyakarta Provincial Health officer in 2019, 2.800 cases DM in Kapanewon Depok); E = error rate (10%); n = sample number (96)

Purposive sampling was used to select the respondents. Participants were eligible if they had taken part in the Chronic Disease Management Program "Prolanis" within the last two years, had at least two HbA1c tests in the previous year, and agreed to participate in the study. Exclusion criteria included incomplete responses, abnormal Hb value in the past year, and being an active blood donor. The data were collected from October to December 2024, after obtaining permission from Sleman District Health Office number 070/1711, 070/1710, and 070/1708.

This study was conducted in accordance with the principles of the Declaration of Helsinki and Good Health Research Practice as defined by the International Conference on Harmonization. All patient provided written informed consent. Ethical clearance number 1689/C.16/FK/2024 was obtained from Unit Komisi Etik Penelitian Kesehatan Fakultas Kedokteran Duta Wacana University.

This study used descriptive statistical analysis. Respondent satisfaction is assessed by examining the gap in each dimension, which is calculated as the actual score minus the expected score. A positive gap indicates extreme satisfaction with the drug information service received. If the gap is zero as the actual and expected scores are equal, the respondent is considered satisfied with the service. Conversely, a negative gap signifies dissatisfaction with the drug information services (Ligoresi *et al*., 2017). The pharmacists' interview results were analyzed descriptively using content analysis without altering the meaning of the words.

RESULTS AND DISCUSSION

The respondents are 98 individuals with type 2 diabetes who obtained drug information services from Pharmacy Unit at the Kapanewon Depok Yogyakarta Primary Healthcare during the period of November-December 2024. Respondent comes from Puskesmas Depok I are 2 respondents, Puskesmas Depok II 20 respondents, and Puskesmas Depok III 76 respondents. The inclusion criteria were met by a total of 159 out of 333 Prolanis patients. A total of 61 patients are eliminated because they did not visit Primary healthcare during the study period or refused to participate by not responding to the invitation. Respondent recruitment process is described in Figure 1.

Respondents' characteristics are presented in Table 1. Most respondents were female (78.6%) aged over 60 years (68.4%). The predominance of women aligns with a recent review study, which showed that women are more active in reporting health complaints (Maulany *et al*., 2021). Physiologically, women have a higher risk of DM due to the decline in estrogen and progesterone hormones during menopause, which reduces insulin sensitivity (Arfania *et al*., 2022; Meidikayanti and Wahyuni, 2017). Respondents were predominantly unemployed (79.6%) with primary school education (33.7%) and had lived with DM for 5–15 years (60.2%). Low educational levels correlate with lack of health awareness and suboptimal lifestyles (Arfania *et al*., 2022; Milita *et al*., 2021). Long-term DM increases the risk of complications due to blood glucose accumulation and decline adherence (Gorat, 2023; Paris *et al*., 2023).

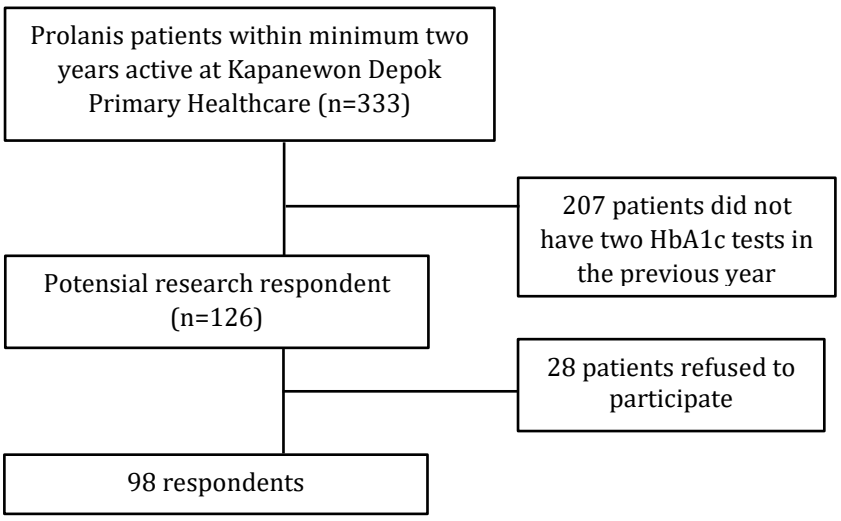

Figure 1. Flowchart of the respondent recruitment process

Table 1. Characteristics of type 2 diabetes patients obtaining drug information services in the period November-December 2024

Characteristics of Patients	Patients (n= 98)	
	n	%
Gender		
Male	21	21.4
Female	77	78.6
Age (years)		
<50	7	7.1
50 - 60	24	24.5
>60	67	68.4
Occupancies		
Employee	20	20.4
Unemployed	78	79.6
Educational background		
Not have formal education	4	4.1
Primary	33	33.7
Junior	18	18.4
Senior	29	29.6
Higher	14	14.2
Diabetes duration (years)		
<5	36	36.7
5 – 15	59	60.2
>15	3	3.1

Table 2. Type 2 diabetic treatment patients

Therapy	Patients (n= 98)	
	n	%
Monotherapy		
Metformin	42	42.9
Gliclazide	1	1.0
Glimepiride	1	1.0
Insulin	1	1.0
Combination therapy		
Metformin + Glimepiride	44	42.9
Metformin + Glibenclamide	1	1.0
Metformin + Glimepiride + Acarbose	1	1.0
Metformin + Insulin	2	2,0
Metformin + Insulin + Glimepiride	2	2,0
Metformin + Insulin + Acarbose	2	2.0
Metformin + Insulin + Gliclazide	1	1.0

Table 3. Comorbidities and therapeutical treatment of type 2 diabetic patients

Comorbidities	Patients (n= 59)		Therapeutic treatment	Number of treatment (n=64)	
	n	%		n	%
Hypertension	50	84.7	Amlodipine	44	68.7
			Candesartan	10	15.6
			Lisinopril	1	1,6
Dyslipidemia	9	15.2	Simvastatin	8	12.5
			Atorvastatin	1	1,6

Treatment Patterns and Comorbidities

DM treatment was dominated by metformin monotherapy (42.9%) and metformin-glimepiride combination therapy (44.9%). The selection of metformin as first-line therapy aligns with Indonesian endocrinologist (PERKENI) recommendations (2021) due to its effectiveness in lowering HbA1c by 1.0–1.3%, high safety profile, and low cost (Jonathan *et al.*, 2019; Maulidya and Oktianti, 2021). A detail of patients' diabetic treatment is presented in Table 2.

A total of 59 respondents had comorbidities, with hypertension (84.7%) and

dyslipidemia (15.2%) being the most common. The dominant antihypertensive drug was amlodipine (68.7%) because it does not affect insulin sensitivity, while simvastatin (12.5%) was chosen for dyslipidemia due to its nephroprotective effects. Statin can also prevent proteinuria and lipid metabolism disorders, thereby reducing the risk of cardiovascular disease (Oktianti *et al*., 2017; Rachmaini *et al*., 2020). Table 3 presents details concerning comorbidities and their therapeutical treatments.

Patient Satisfaction with Medication Information Services

Patient satisfaction was analyzed using the gap analysis concept based on the seven principles of medication administration, measuring the difference between patients' expectations and their actual experiences. Respondents' medical information satisfaction are presented in Table 4.

Puskesmas Depok I respondents showed satisfaction toward all dimensions. The dimensions of right patient, right dose, right medication, and right time of administration was satisfied (gap=0), while right method of administration (gap=+0.25) and right information (gap=+0.15) reached very satisfied category. The standard deviation (SD) of 0 in the first four dimensions indicates consistency in respondents' perceptions, suggesting standardized and optimal information services.

Puskesmas Depok II respondents revealed a variance satisfaction result. Five out of six dimensions show extreme satisfaction with positive gap scores: right patient (gap=+0.15), right dose (gap=+0.20), right administration time (gap=+0.30), right administration method (gap=+0.30), and right information (gap=+0.17). However, the dimension of correct medication shows a negative gap (gap=-0.07), indicating dissatisfaction, particularly regarding the communication of medication side effects.

This finding contradicts the pharmacist's statement that all information had been provided: "I had informed the possibility of side effects medication, which are also written in the documentation form."

This discrepancy is likely due to the characteristics of the respondents, who were mostly elderly without companions, making it difficult for them to remember the information provided (Ramadhani, 2021).

Respondents of Puskesmas Depok III showed extreme satisfaction among the six dimensions. It showed a positive gap in right patient, right dose, right medication, right time of administration, right administration method, and appropriate information. These results indicate comprehensive and optimal medication information services (Arfania *et al*., 2022).

Barriers to Drug Information Services

The identification of obstacles revealed two main factors affecting the quality of drug information services such as:

a. Patient demographic factors

The predominance of senior patients is a significant barrier at the Depok I and II *Puskesmas.* The decline in cognitive and hearing abilities among the elderly affects their ability to receive and retain information (Ramadhani, 2021). This condition is exacerbated by the lack of companions who can help ensure understanding of the information. "Most diabetic patients are senior who comes without companions, therefore I doubted their understanding" said pharmacist at *Puskesmas* Depok I. "Giving medication information to seniors, I had to repeat it over and over. Asking questions are usual before leaving the pharmacy. They are confusing" said a pharmacist at Puskesmas Depok II.

b. Infrastructure factors

There were glass partitions between staff and patients at Puskesmas Depok II. This physical barrier reduces the effectiveness of the communication, and requires repetition of the information. Due to declining cognitive and hearing ability this could potentially impact the elderly patients.

Table 4. Medical information service satisfaction of patients with type 2 diabetes

Dimension' measure	Patient Gap score*		
	Puskesmas Depok I	Puskesmas Depok II	Puskesmas Depok III
Right patient	0	+0.15	+0.06
Right dose	0	+0.20	+0.13
Right medication	0	-0.07	+0.04
Administration right time	0	+0.30	+0.14
Administration right method	+0.25	+0.30	+0.15
Right information	+0,15	+0.17	+0.06

*positive gap score = extreme satisfaction, zero gap score = satisfy, negative gap score = dissatisfaction.

Clinical Implications and Recommendations

Research findings indicate variability in satisfaction across healthcare facilities, highlighting the need for standardization of medication information services. Primary Healthcare centers with negative gaps require improvements in communication systems, particularly for elderly patients.

Recommendations include: (1) developing information media suitable for the elderly, (2) training in therapeutic communication for pharmacy staff, (3) improving infrastructure to reduce communication barriers, and (4) implementation of a companion or family system in the drug counselling process.

The limitations of this study are linked to the uneven distribution of samples across primary healthcare and the limited data collection period. Further research with a more representative sample size and longitudinal design is necessary to confirm these findings.

CONCLUSIONS

Satisfaction with drug information services among patients with diabetes mellitus varies across the Kapanewon Depok Yogyakarta Primary Healthcare facilities. Satisfaction levels are generally good to excellent in several areas, including the correct patient identification, right dosage, right medication, timely administration, proper administration methods, and the delivery of accurate information. However, pharmacists have identified age as major barriers, especially in elderly patients as well as infrastructure-related issues. These findings are paramount for optimizing pharmaceutical services at the primary care level.

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CONFLICT OF INTEREST

The authors declare that there are no conflicts of interest. The study data can be accessed by contacting the corresponding author. For clarification of the research instruments, if needed, please contact the corresponding author.

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