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The Relationship Between Pharmacist Workload and the Clinical Pharmacy Services Quality of Kulon Progo Regency

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ABSTRACT

Background: Clinical pharmacy service activities are the decisive roles of pharmacists in ensuring patient safety and quality of life, so there is a need for quality control in their implementation. However, several studies classify the clinical pharmacy services quality at primary health centers as needing improvement. On the other hand, pharmacists at primary health centers in Kulon Progo are overburdened, exceeding the standard rasio.

Objectives: This study aims to determine the relationship between the pharmacists workload and the clinical pharmacy services quality.

Methods: This study is an analytic observational study with a retrospective and prospective approach. The research participants are five pharmacists from the three sample primary health centers. The pharmacist's workload was measured using the daily log workload form, while the clinical pharmacy services quality was measured using ten indicators of clinical pharmacy service quality. The pharmacist workload is classified into heavy (>80%), moderate (60-80%), or light (<60%) categories. Meanwhile, the quality of clinical pharmacy services is classified into proper (>75%), fair (56-75%), or poor (<56%). The relationship between pharmacist workload and clinical pharmacy service quality was analyzed using the Somers correlation test.

Results: The pharmacists' workload at Sentolo I, Temon I, and Galur II primary health centers, respectively, is heavy (94.05%), heavy (84.55%), and moderate (79.91%). The clinical pharmacy services quality at Sentolo I, Temon I, and Galur II primary health centers, respectively, were fair (56.57%), fair (69.21%), and proper (79.05%). Somers test results show a significant relationship (p=0.014) between the pharmacists' workload and the clinical pharmacy services quality. The correlation coefficient obtained is -1,000.

Conclusion: There is a significant relationship between pharmacist workload and clinical pharmacy service quality.

Keywords: pharmacist; primary health centers; quality of clinical pharmacy service; workload

INTRODUCTION

A primary health center is one of the first-level health facilities spread across all subdistricts in Indonesia. Based on data from the Indonesian Ministry of Health in 2019, every subdistrict in Indonesia has at least one primary health center.[1] Therefore, primary health centers are a highly strategic target for improving the quality of Indonesian health services.

Pharmacy services play a significant role in improving healthcare quality at primary health centers. These services include two main activities: (1) managing drugs and disposable medical supplies and (2) clinical pharmacy services. Clinical pharmacy services at primary health centers include prescription screening, drug information services, counselling, visits, monitoring of adverse drug reactions, monitoring drug therapy, and evaluating drug use.[2] Clinical pharmacy services ensure patient safety and quality of life. Therefore, it is essential to implement quality control measures to maintain the quality of clinical pharmacy services. However, several

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studies still indicate that the quality of clinical pharmacy services at primary health centers needs to be improved.[3–7]

The quality of pharmaceutical services is influenced by human resources, facilities and infrastructure, availability of funds, availability of standard operational procedures, communication and cooperation between employees, policies, organization, management, culture, and the level of community education.[2] Previous research analysed the influence of managerial aspects on clinical pharmacy services. The results of this research state that there is an influence between managerial aspects on clinical pharmacy services.[8] Meanwhile, other studies analyze the influence of the presence of pharmacists on the quality of pharmaceutical services at primary health centers. The results obtained are that the presence of pharmacists has not improved the quality of pharmaceutical services based on the availability of fixed procedures and checklists for pharmaceutical services at the primary health center.[5] Other literature states that the high workload of pharmacists increases the potential for medication errors to occur.[9] However, there has been no research that comprehensively discusses the influence of pharmacist workload on the quality of clinical pharmacy services at primary health centers.

Meanwhile, according to data from the Health Office of Kulon Progo Regency in 2020, it is evident that pharmacists at primary health centers in the area are overburdened, exceeding the standard ratio. The data shows that each pharmacist is responsible for serving an average of 80 patients per day, which is well above the standard ratio of one pharmacist to 50 patients per day set by pharmaceutical service standards.[2,10] Based on this background, this research was conducted to determine the relationship between pharmacist workload and the quality of clinical pharmacy services at primary health centers in Kulon Progo Regency.

METHODS

Research design

This study is an analytical observational study with a retrospective and prospective approach. It was conducted from November 22, 2021, to February 21, 2022, in Kulon Progo Regency, Special Region of Yogyakarta. Primary data sources used daily log workload forms and observations of clinical pharmacy service activities conducted by sampled primary health centers. The secondary data sources included drug information service documents, visit documents, drug side effects monitoring, drug therapy documents, and dispensing error incident documents from each sampled primary health center from January to July 2021. The specified period was selected to ensure that the obtained data aligns with the prospective data, thereby enhancing accuracy and eliminating any potential data gaps.

Population and Sample

The target of this research is the primary health centers in Kulon Progo Regency that have inpatient facilities and are willing to participate as research respondents. Kulon Progo Regency has six inpatient primary health centers. Three primary health centers were chosen as samples using convenience sampling, namely Sentolo I, Temon I, and Galur II primary health center. These three primary health centers are in different subdistricts and cover the western, northeastern, and central areas of Kulon Progo.

The research subjects are five pharmacists from the three sample primary health centers, who were selected using total sampling. Prescription sheets were selected using systematic random sampling with a sample size of 100 prescription sheets from each primary health center. The inclusion criteria for prescription sheet samples are prescriptions for outpatient care during the research period and for patients from January to July 2021. The prescriptions that were unreadable and incomplete were excluded from this research. Samples of drug information service documents, visit documents, drug side effects monitoring, drug therapy documents, and dispensing error incident documents were selected through total sampling from all available documents.

Research Instrument

The instrument used to assess pharmacist workload is the daily log workload form. At the same time, the quality of clinical pharmacy services is measured using ten indicators of clinical pharmacy service quality developed by Satibi et al.,[11] and then modified for this study. Several indicators from previous research were assessed by simply counting the documents available in the measurement period as evidence that the activity had been implemented. Meanwhile, in this research, researchers not only counted the number of existing documents but also calculated the number of activities that should be carried out by pharmaceutical service standards. Thus, the data obtained is the percentage of implementation of activities by pharmaceutical services. The clinical pharmacy service quality indicators used in this research include prescription screening, labeling,

providing drug information when delivering drugs to the patients, service time, drug information service, counseling, visits, monitoring of adverse drug reactions, monitoring of drug therapy, and dispensing error incidents.

Data Analysis

The study compiled the results of daily log forms completed by pharmacists over six days to categorize their activities into productive, non-productive, and personal activities. The workload of pharmacists was calculated by adding up the total time they spent on productive activities, dividing it by the total working hours set by the primary health center, and multiplying it by 100%. Based on these percentages, the study classified the pharmacist workload into heavy (>80%), moderate (60-80%), or light (<60%) categories.

The observations and data collection regarding the quality of clinical pharmacy services for each indicator were analyzed quantitatively in quantity and percentage. The percentages of each clinical pharmacy service quality indicator were summed and averaged. The average results were then used to classify the quality of clinical pharmacy services into proper (>75%), fair (56-75%), or poor (<56%). The relationship between pharmacist workload and the quality of clinical pharmacy services was analyzed using the Somers correlation test with the Statistical Product and Service Solutions (SPSS) program. Hypothesis testing was conducted at a 95% confidence interval or a significance level (α) of 5%.

RESULTS AND DISCUSSION

This study was conducted in three primary health centers in Kulon Progo Regency, Special Region of Yogyakarta. The health centers included were Sentolo I, Temon I, and Galur II. Five pharmacists participated in the study, with one pharmacist from Sentolo I, two from Temon I, and two from Galur II. The characteristics of the sampled primary health centers are presented in Table I.

Table I. Characteristics of Research Sample Primary Health Centers

No	Characteristics	Sentolo I Primary Health Center	Temon I Primary Health Center	Galur II Primary Health Center
1.	Number of pharmaceutical personnel	1 pharmacist, 1 pharmacy technical, and 2 administration	2 pharmacist, 1 pharmacy technical, and 1 administration	2 pharmacist
2.	Inpatient	yes	yes	yes
3.	Region of services health	4 villages with 43 hamlets	8 villages with 50 hamlets	3 villages with 30 hamlets
4.	Number of residents in the region of services health [12]	27.105 people	15.818 people	10.313 people
5.	Average patient visits in 2021	63 patients/day	70 patients/day	51 patients/day
6.	Number of prescriptions from January to July 2021	6.769	6.579	3.757
7.	Number of prescriptions during seven days of observation	350 (301 non-compounding recipes and 49 compounding recipes)	253 (244 non-compounding recipes and 9 compounding recipes)	176 (155 non-compounding recipes and 21 compounding recipes)
8.	Number of priority counseling patients during seven days of observation	50	61	56
9.	Number of inpatients from January to July 2021	22	163	63
10.	Number of priority patients for drug therapy monitoring	3.785	2.711	1.331

Table *II.* Calculation Result of Workload for Pharmacists at Kulon Progo Regency Primary Health Centers

Component	Sentolo I Primary Health Center	Temon I Primary Health Center		Galur II Primary Health Center	
		Pharmacist 1	Pharmacist 2	Pharmacist 1	Pharmacist 2
Workload (%)	94,05	88,33	80,77	84,14	75,68
Average (%)	94,05	84,55		79,91	

The Workload of Pharmacists in Kulon Progo Regency Primary Health Centers

The study measured the workload of pharmacists using the daily log method. The daily log method is a workload measurement method that has been used in previous studies and has been tested for validity.[13–16] This method was chosen due to the increasing impact of the COVID-19 pandemic during the research. The daily log method was selected to minimize contact between the researcher and the research subjects, i.e., the pharmacists. It was because the pharmacists could fill in the observation forms of all their activities independently, including the time required to perform them. However, the researcher still observed pharmacists' participation while collecting workload data from the pharmacists.

Based on the calculation, the results show that pharmacists at Sentolo I and Temon I primary health centers have a heavy workload, whereas Galur II has a moderate workload. The calculation results of pharmacist workload are shown in Table II. Pharmacists at Sentolo I and Temon I primary health centers have a heavy workload, as the pharmacist workload from these two primary health centers exceeds 80%.[17] Other literature also states that the optimal standard for each personnel working time is if personnel can utilize 80% of their time for productive activities. If personnel work more than 80% of their effective time, the work unit faces a high workload.[18] This opinion is supported by interviews with pharmacists at Sentolo I and Temon I primary health centers who complained about the high workload due to the large number of outpatient services, the variety of activities to be performed (service, managerial, administrative, regional support), the COVID-19 vaccination program, and the lack of adequate facilities and infrastructure, such as the absence of computers for data entry at Temon I primary health center.

According to pharmaceutical service standards,[2] there should be at least one pharmacist for every fifty patients per day at primary health centers. However, at Sentolo I primary health center, the ratio between the number of pharmacists and patient visits per day is 1:63, which indicates an imbalance between the number of pharmacists and the number of patients to be served. Additionally, pharmacists at Sentolo I primary health center are also responsible for tasks that should be handled by pharmacy technicians, even though the center has pharmacy assistants. This additional workload makes pharmacists heavier and contributes to the imbalance. In contrast, the ratio between the number of pharmacists and the number of patient visits at Temon I primary health center meets the standard, with two pharmacists for 70 patients per day.

On the other hand, the workload of pharmacists at Galur II Primary Health Center is classified as moderate, as their workload falls within the range of 60-80%.[17] Pharmacists at Galur II Primary Health Center also stated that the number of outpatient visits at Galur II Primary Health Center is relatively low, thus the workload for outpatient services is not too heavy. These results are supported by the ratio between the number of pharmacists and the number of patient visits, which meets the Galur II primary health center standard, with two pharmacists for 51 patients/day.

Quality of Clinical Pharmacy Services at Kulon Progo Regency Primary Health Centers Prescription screening

The assessment of prescription screening indicators is evaluated by calculating the percentage of prescriptions that undergo an assessment by pharmacists, considering administrative, pharmaceutical, and clinical requirements, compared to the total number of prescriptions during the measurement period.[11] The measurement results of prescription screening indicators, as displayed in Table III, from the three primary health centers indicate that there still needs to complete the administrative screening, such as patient age, weight information, and the doctor's name and signature. The percentage of screening for patient age and weight still needs to be higher at Sentolo I and Temon I primary health centers because these screenings are only conducted for pediatric patients. Patient age information is essential to determine the appropriate drug dosage and formulation.[19] According to the literature, patient weight information is necessary for prescriptions to calculate the patient's drug dosage.[20] The screening of the doctor's name and signature has also not been conducted at Sentolo I primary health center, as pharmacists feel they are already familiar with the doctor's handwriting on the prescriptions, and, therefore, no assessment is made of the doctor's name and signature.

Table III. Measuring the Results of Prescription Assessment Indicators: 100 Prescription Samples from Each Primary Health Center

Screening	Component	Sentolo I	Temon I	Galur II
Administrative	Name	100 (100%)	100 (100%)	100 (100%)
	Age	7 (7%)	9 (9%)	100 (100%)
	Gender	100 (100%)	100 (100%)	100 (100%)
	Weight	7 (7%)	9 (9%)	100 (100%)
	Doctor's name	0 (0%)	100 (100%)	100 (100%)
	Doctor's signature	0 (0%)	100 (100%)	100 (100%)
	Prescription date	100 (100%)	100 (100%)	100 (100%)
	Room/unit where the prescription originates	100 (100%)	100 (100%)	100 (100%)
Pharmaceutical	Dosage form	100 (100%)	100 (100%)	100 (100%)
	Strength of the drug preparation	100 (100%)	100 (100%)	100 (100%)
	Drug dosage	100 (100%)	100 (100%)	100 (100%)
	Amount of medication	100 (100%)	100 (100%)	100 (100%)
	Drug stability	0 (0%)	13 (13%)	100 (100%)
	Availability of medication	100 (100%)	100 (100%)	100 (100%)
	Rules of use	100 (100%)	100 (100%)	100 (100%)
	Direction to use	100 (100%)	100 (100%)	100 (100%)
	Incompatibility	0 (0%)	0 (0%)	100 (100%)
Clinical	Indication	100 (100%)	100 (100%)	100 (100%)
	Dose	100 (100%)	100 (100%)	100 (100%)
	Time of drug administration	100 (100%)	100 (100%)	100 (100%)
	Duplication of medication	0 (0%)	100 (100%)	100 (100%)
	Allergy	1 (1%)	11 (11%)	100 (100%)
	Drug interactions	100 (100%)	8 (8%)	100 (100%)
	Drug side effects	100 (100%)	100 (100%)	0 (0%)
	Contraindications	100 (100%)	100 (100%)	100 (100%)

According to the literature, information about the doctor's name and signature must be included in the prescription to confirm the therapy or treatment given to the patient in case of errors in prescribing.[20] Including the doctor's signature also plays a crucial role in ensuring the authenticity, legality, and validity of the prescription, making it accountable.[19]

The pharmaceutical screening that is not widely conducted includes the screening of drug stability and incompatibility. The percentage of drug stability screening conducted by Temon I Primary Health Center is only 13% because the assessment is limited to certain formulations such as syrups, ointments, eye drops, and ear drops. Meanwhile, Sentolo I primary health center has not screened for drug stability. Information about drug stability is crucial to determine the storage conditions and shelf life of a pharmaceutical formulation following the established standards. It also helps in understanding the compatibility of pharmaceutical formulations during the drug-compounding process. Information about storage and shelf life or expiration dates must be communicated to the patient when the medication is delivered. The goal is to ensure patients receive safe, effective, high-quality medications.[21] Regarding information about drug incompatibility, it is essential to assess to avoid occurrences of drug non-mixing during the compounding process, either physically or chemically, which may result in a loss of potency, an increase in toxicity, or other side effects.[22]

Clinical screening that is not widely conducted includes information about patient allergies. Screening patient allergies is crucial to avoid administering drugs to patients who are hypersensitive to those drugs. Therefore, assessing patient allergies can minimize the risk of unexpected drug reactions.[23] Patient allergy assessments at Sentolo I and Temon I primary health centers have been conducted but are limited to patients receiving antibiotics.

Drug labeling

The labeling indicator is assessed by calculating the percentage of drugs labeled correctly, including the patient's name, date, direction to use, drug name, indication, BUD (Beyond-Use Date), pharmacist's signature,

and color label compliance.[11] The research results shown in Table IV indicate that certain information is rarely included on drug labels; to be more specific, the purpose or indication of the drug and the pharmacist's signature are mostly not found on the drug labels.

Information about the indication of the drug is infrequently included on labels at Sentolo I, Temon I, and Galur II primary health centers because it is only provided for specific drugs such as paracetamol, ibuprofen, N-acetylcysteine, dexamethasone, kaolin-pectin, and cetirizine. According to the literature, information about the purpose or indication of the drug is crucial to include on labels to enhance patient understanding of the benefits of the drug, especially for geriatric patients who may be taking multiple medications simultaneously.[24]

Pharmacist signatures were not included on labels at the primary health centers in Sentolo I and Temon I. Although they are present on labels at Galur II Primary Health Center, the percentage is still small. This is because pharmacists from these three primary health centers provide their signature on the prescription screening form, drug dispensing checklist, and drug information. Pharmacists do not include their signature on the label since they consider providing it on the forms as enough evidence. Based on the literature, the label must include the signature of a pharmacist to indicate that the drug was prepared, compounded, and dispensed by authorized personnel. Additionally, including the pharmacist's signature aims to show that the personnel who crafted the drug have approved that the drug was prepared according to its label.[11]

Information about the drug's name has also not been included on the drug labels of Sentolo I and Galur II primary health centers, while the drug labels of Temon I primary health center have included the drug's name on all labels. Sentolo I and Galur II primary health centers have yet to include information about the drug's name on the labels because their labels are small and infair to write the drug's name. Furthermore, the drug's name has not been included on the labels to save time, as writing the drug's name on all labels would take a considerable amount of time and could result in longer queues. According to the literature, including the drug's name on the label is essential for patients to cross-check that the name on the label matches the name on the packaging, reducing the risk of label mix-ups and medication errors.[11]

Providing drug information when delivering drugs to the patient

The indicator of providing drug information when delivering drugs to the patients is assessed by calculating the percentage of drug delivery accompanied by information that includes at least the drug's name, direction to use, indications, non-pharmacological therapy, and storage information. The measurement results of the delivery indicator with information listed in Table V show that information about drug storage and non-pharmacological therapy is limitedly provided by pharmacists in the three primary health centers.

Table IV. Measuring the Results of Providing Drug Information Indicators: 100 Prescription Samples from Each Primary Health Center

Component Information	Sentolo I	Temon I	Galur II
Name of drug	6 (6%)	100 (100%)	70 (70%)
Direction to use	99 (99%)	100 (100%)	98 (98%)
Indication	47 (47%)	93 (93%)	86 (86%)
Direction to store	0 (0%)	1 (1%)	9 (9%)
Non-pharmacological information	0 (0%)	11 (11%)	7 (7%)

Information about drug storage has a low percentage of delivery because it is only provided for specific drugs that require special storage, such as suppositories and compounded powder drugs. Meanwhile, information about non-pharmacological therapy is only given to specific patients, such as those with hypertension, diabetes mellitus, patients receiving calcium supplements, and some other patients. According to the literature, storage information should be communicated so that patients can store medications according to standards, ensuring the quality of the drugs.[11] Additionally, information about non-pharmacological therapy is needed to support therapy, such as lifestyle changes like dietary intake or activities that need to be observed during treatment.

Moreover, information about the drug's name and indications still needs to be provided at Sentolo I primary health center. This is because the drug dispensing activity at Sentolo I primary health center is carried out by pharmacy technical personnel rather than by pharmacists. Overall, the constraints faced by all three primary health centers in providing drug information are limited time. In Sentolo I and Temon I primary health

centers, there is often an overload of patients, resulting in information not being provided comprehensively according to standards.

Service time

The prescription service time is calculated by determining the percentage of time it takes for a prescription to be processed, from the moment it is received until the patient gets the medication, including all necessary information. The Ministry of Health sets the standard prescription service time at ≤30 minutes for non-compounded and ≤60 minutes for compounded prescriptions.[11] After conducting observations, all three primary health centers sampled have met the standard prescription service time. The results are listed in Table VI.

Table V. Percentage of Compliance of Prescription Service Time with Standards

Prescription type	Sentolo I	Temon I	Galur II
Non-compounded (min)	5.18	11.51	4.02
Compunded (min)	9.42	21.6	8.4
Time compliance with standards (%)	100	100	100

Drug information services

The drug information services indicator is assessed by calculating the percentage of drug information services implemented compared to the pharmacy service standards at the primary health centers. Drug information services standards consist of active and passive information services. Active information services mean drug information services initiated by the pharmacist, such as providing counseling, education or training, coordinating drug research, and creating posters, leaflets, wall magazines, etc. On the other hand, passive information services involve pharmacists waiting for questions from patients, patient's families, or other healthcare providers.[2,25]

Table VI. Measuring Results of Drug Information Services Indicators

Indicator	Sentolo I	Temon I	Galur II
Drug information services	1/5 (20%)	1/5 (20%)	0/5 (0%)

Based on the research results as listed in Table VII, all sampled primary health centers must implement drug information services activities fully. For instance, Sentolo I primary health center only engages in active drug information services by creating flipcharts containing instructions on using specific drugs. The passive drug information services activities conducted by the Sentolo I primary health center pharmacist have yet to be documented.

Conversely, Temon I's primary health center focuses on passive drug information services activities, with 13 documented instances of passive drug information services from January to July 2021. Temon I Primary Health Center has not implemented active drug information services due to constraints posed by the COVID-19 pandemic. The pandemic restrictions, following health department regulations, prohibit the sticking of posters or distribution of leaflets as it could contribute to the spread of COVID-19. Additionally, the pharmacy staff at Temon I Primary Health Center prioritizes vaccination activities.

On the other hand, Galur II primary health center has no documented passive drug information services activities. This is due to a misconception by the pharmacist, who considered drug information services to be synonymous with providing information about drugs during the drug dispensing process. Therefore, the pharmacist only documented the provision of drug information as part of the prescription service. Meanwhile, according to Minister of Health regulations number 74 of 2016, providing drug information during the drug delivery process is included in a concatenation of prescription service activities.[2]

Counseling

The counseling indicator is evaluated by calculating the percentage of patients who receive counseling compared to the total number of patients prioritized for counseling. The results of the counseling Indicator as listed in Table VIII show that pharmacists have started conducting counseling activities, although the percentage is still low. The main factors contributing to the limited implementation of counseling are the high number of

patients and limited time allocation. This is evident in Sentolo I and Temon I primary health centers. If counseling is provided to all patients prioritized for counseling as outlined in the Minister of Health Regulation number 74 of 2016,[2], then the patient waiting time would increase. Additionally, many patients are in a hurry, making it difficult for pharmacists to provide counseling. Some patients also decline counseling because they are regular patients who are familiar with the prescribed medications and feel they do not need counseling. A study conducted by Rajjah et al. also yielded similar results, highlighting constraints such as limited time for counseling amidst other responsibilities, a shortage of pharmacists, a lack of confidence among pharmacists to provide counseling, and patients refusing counseling offers.[26]

Table VII. Measuring Results of Counseling Indicators

Indicator	Sentolo I	Temon I	Galur II
Counseling	0/50 (0%)	4/61 (6,56%)	4/56 (7,14%)

In Galur II primary health center, the constraint is related to the pharmacy space, which could be more conducive to counseling, or the absence of a dedicated room for counseling. This aligns with a study by Ejeta et al., which indicated that the lack of a counseling room in pharmacy facilities is one of the factors contributing to the suboptimal implementation of counseling by pharmacists.[27]

In addition to these factors, all the primary health centers sampled face challenges in documenting counseling activities. This aligns with the National Health Indicator Survey Report for 2016, which showed that only 30.3% of primary health centers document counseling activities.[28]

Visiting Patient

The visit indicator is assessed by calculating the percentage of inpatients who receive pharmacist visitation compared to the total number of inpatients. Based on the research results as listed in Table IX, Sentolo I primary health center performs observations for inpatients but does not document them, resulting in a visit indicator of 0%. The lack of documentation is attributed to the pharmacist's inability to conduct documentation, given the perceived burden of providing prescription services. Additionally, most inpatients at Sentolo I primary health center are maternity patients who stay overnight, contributing to the limited need for comprehensive visitation.

Table VIII. Measuring Results of Visit Indicators

Indicator	Sentolo I	Temon I	Galur II
Visite	0/22 (0%)	30/163 (18,40%)	63/63 (100%)

Temon I primary health center has a visit indicator of 18.40%, indicating that visitation activities have been initiated but have yet to be implemented comprehensively for all inpatients. The partial implementation is attributed to COVID-19 constraints and strict limitations from January to July 2021. Additionally, one Temon I primary health center pharmacist was on maternity leave during this period, so the other pharmacist prioritized outpatient prescription services over visits. The visit activity carried out by the Temon I primary health center pharmacist is a joint visit with other healthcare professionals.

In contrast, Galur II Primary Health Center has conducted comprehensive and well-documented visitation activities. However, the visits undertaken by the pharmacist at Galur II Primary Health Center are still individual, and joint visits with other healthcare professionals have not been carried out. It is recommended that Galur II Primary Health Center consider implementing joint visits to benefit patients further. Join visits enable pharmacists to communicate and discuss the patient's condition and suitable therapy with other healthcare professionals, leading to more optimal clinical outcomes.[29]

In summary, while Sentolo I primary health center faces challenges in implementing comprehensive visitation, Temon I has made progress but has yet to achieve full coverage. Galur II Primary Health Center has successfully implemented visits but could enhance the practice by conducting joint visits with other healthcare professionals.

Monitoring of adverse drug reactions

The monitoring of adverse drug reactions (ADR) indicator is assessed by calculating the percentage of drug adverse events that are followed up and reported to the National Agency of Drug and Food Control (BPOM). The measurement results are shown in Table X. Sentolo I and Galur II primary health centers have not conducted monitoring of ADR activities because there have been no reports of adverse drug events. Similar findings were obtained in a study conducted at Rawamerta Primary Health Center in 2021, where monitoring ADR activities was not implemented due to the absence of patient reports or complaints regarding drug adverse events.[30] Another study also attributes the low monitoring of drug adverse events to limitations faced by pharmacy personnel and the lack of patient participation in independently reporting adverse events when using drugs.[4] The underreporting of drug adverse events can introduce biases in the number of adverse events and the existence of adverse events in Indonesia.[11]

Table IX. Measuring Results ADR Monitoring Indicators

Indicator	Sentolo I	Temon I	Galur II
Monitoring of adverse drug reactions	-	0 (0%)	-

Note : - (no reports of adverse drug events)

In Temon I primary health center, there were two reports of drug adverse events. However, the pharmacist only recorded these events and did not report them to BPOM, resulting in a MESO indicator of 0%. According to the pharmacist, the reason for not reporting the adverse events to BPOM was the need to conduct a causality analysis using the Naranjo Algorithm to determine the causal relationship between the adverse events and the use of the drug. However, the pharmacist needed to remember how to perform the causality analysis, leading to abandoning the analysis process. According to BPOM statements,[31] any suspected adverse event related to drugs, whether an adverse event with an unknown causal relationship or a confirmed adverse drug reaction (ADR), should be reported to BPOM. BPOM will conduct causality analysis. Healthcare professionals reporting adverse events are not obliged to conduct causality analysis. However, healthcare professionals can analyze the causality for each patient to evaluate individual cases, ensuring each patient receives the best care. Healthcare professionals can analyze personal causality using the Naranjo Algorithm table in the adverse event reporting form or the yellow form.

Monitoring of drug therapy

The drug therapy monitoring indicator is assessed by calculating the percentage of patients who receive monitoring of drug therapy compared to the total number of priority monitoring of drug therapy patients. The research results as listed in Table XI indicate that drug therapy monitoring activities have yet to be implemented at Sentolo I and Galur II primary health centers.

Table X. Measuring Results of Drug Therapy Monitoring Indicators

Indicator	Sentolo I	Temon I	Galur II
Monitoring of drug therapy	0/3.785 (0%)	364/2.711 (13,43%)	0/1.331 (0%)

In Sentolo I primary health center, the reason for not implementing drug therapy monitoring is that the activity could be more complex, especially in gathering supporting data for monitoring drug therapy. The high number of patients to be serviced and limited time also contribute to the complexity. Therefore, pharmacists feel they need to be more capable of conducting drug therapy monitoring activities for patients.

In Galur II primary health center, the non-implementation of drug therapy monitoring is attributed to inadequate human resources/pharmacy personnel, as there are only two pharmacists in Galur II primary health center without additional pharmacy staff. This limitation leads the pharmacists to prioritize other responsibilities, making it challenging to conduct drug therapy monitoring. Other studies have also reported similar findings, citing the limited availability of pharmacy personnel as a common reason for not implementing drug therapy monitoring.[4]

Drug therapy monitoring activities have been implemented in Temon I primary health center, but the percentage is still low at 13.43%. The execution of drug therapy monitoring in Temon I primary health center is currently limited to patients with diabetes mellitus, hypertension, and mental disorders. According to the

Minister of Health Regulation number 74 of 2016,[2], the criteria for drug therapy monitoring patients include pediatric patients, geriatric patients, pregnant and lactating mothers, those receiving more than five types of medication, those with multiple diagnoses, patients with kidney or liver function disorders, patients receiving narrow therapeutic index drugs, and patients receiving medications known to cause adverse reactions. The limited implementation of drug therapy monitoring to specific patient groups is attributed to the pharmacist's perception of their inability to do so. This is due to pharmacists' already high workload, especially outpatient prescription services. Additionally, pharmacists need help with documenting drug therapy monitoring activities due to the large number of patients they have to attend.

Dispensing error

The dispensing error indicator is assessed by calculating the percentage of prescriptions that did not experience dispensing errors compared to the total number of prescriptions. From January to July 2021, 2 dispensing error incidents were out of 6,579 prescriptions in Temon I primary health center. The dispensing errors occurred when taking the wrong medication due to the similarity in drug names. According to the literature, factors contributing to medication errors during the dispensing phase include an imbalance between workload and human resources, similar drug packaging, Look-Alike-Sound-Alike (LASA) drugs, LASA drug storage systems, and environmental disturbances such as interruptions.[32] Conversely, no dispensing errors were reported in Sentolo I and Galur II primary health centers during the January-July 2021 period. The measurement results are shown in Table XII.

Table XI. Measuring Results of Dispensing Error Indicators

Indicator	Sentolo I	Temon I	Galur II
Recipes without dispensing error	6.769/6.769 (100%)	6.577/6.579 (99,97%)	3.757/3.757 (100%)

This study is limited to assessing the dispensing error indicator and has not been able to evaluate all indicators of medication errors, which include prescribing errors, dispensing errors, and administration errors. This limitation is due to the retrospective nature of the data evaluation. Additionally, pharmacists did not document every incident of prescribing error and administration error that occurred, making it challenging to measure the occurrence of medication errors comprehensively.

Average Quality of Clinical Pharmacy Services at the Kulon Progo Regency Primary Health Centers

Based on Table III-XII, the average quality of clinical pharmacy services at Sentolo I, Temon I, and Galur II primary health centers are 56.57%, 69.21%, and 79.05%, respectively. According to these results, the quality of clinical pharmacy services at Sentolo I and Temon I primary health centers falls within the category of fair since the average quality is within the range of 56% to 75%.[33] On the other hand, the quality of clinical pharmacy services at Galur II primary health center is considered proper as the average quality exceeds 75%.[33]

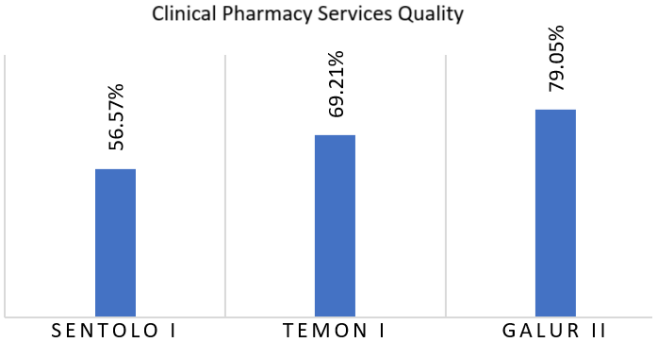

Figure 1. Clinical Pharmacy Services Quality

It's important to note that this assessment is limited to the perspective of the primary health centers as the service provider. The study does not include an evaluation of patient satisfaction with the services provided

by the primary health centers. Therefore, incorporating patient satisfaction aspects could offer a more comprehensive understanding of the quality of clinical pharmacy services.

The Relationship Between Pharmacist Workload and The Quality of Clinical Pharmacy Services at The Kulon Progo Regency Primary Health Centers

The correlation analysis using Somers yielded a significance value (p-value) of 0.014 (p-value <0.05). This implies a significant relationship between the pharmacist's workload and the quality of clinical pharmacy services.[34] The correlation coefficient (r) obtained was -1.000, indicating a perfect negative correlation, meaning that as the pharmacist's workload increases, the quality of clinical pharmacy services decreases, and vice versa.[35,36] Correlation analysis between pharmacist workload and the quality of clinical pharmacy services is shown in Table IV.

Table I. Somers'd Correlation Test Results

		Quality of clinical pharmacy services		Total	*r*	*p*
		Fair	Proper			
Pharmacist workload	Moderate	0	1	1	-1,000	0,014
	Heavy	2	0	2		
Total		2	1	3		

This finding is consistent with the statements of Marquish and Huston, who suggest that a high workload can lower service quality and lead to customer dissatisfaction.[37] Other literature also indicates that factors such as a shortage of pharmacists, insufficient knowledge of counseling management, and heavy workloads may influence clinical pharmacy services in primary health centers.[8] Additionally, previous research has shown that a high workload contributes to increased medication errors, such as failure to detect prescribing and dispensing errors.[9,38]

The study was restricted to utilizing only three samples from Primary Health Centers and incorporating only five pharmacists as research subjects. In part due to the constraints imposed by the COVID-19 pandemic. As a result, a study with a larger sample can be conducted to obtain better results in exploring the relationship between pharmacist workload and the quality of clinical pharmacy services.

CONCLUSION

Based on the research findings, the workload of pharmacists in Sentolo I, Temon I, and Galur II primary health centers is categorized as heavy (94.05%), heavy (84.55%), and moderate (79.91%), respectively. Meanwhile, the quality of clinical pharmacy services in Sentolo I, Temon I, and Galur II primary health centers is categorized as fair (56.57%), fair (69.21%), and proper (79.05%), respectively. The relationship between the pharmacist's workload and the quality of clinical pharmacy services in Kulon Progo Regency primary health centers is significant. The strength of this relationship is perfect with a negative direction. If the pharmacist's workload increases, the quality of clinical pharmacy services decreases, and vice versa.

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STATEMENT OF ETHICS

The study has obtained ethical clearance approval from the Research Ethics Commission for Health, Faculty of Medicine, Diponegoro University, with the number 430/EC/KEPK/FK-UNDIP/XI/2021.

REFERENCES

1. Kemenkes RI. Profil Kesehatan Indonesia Tahun 2019. Jakarta: Kementerian Kesehatan Republik Indonesia; 2020.
2. Menkes RI. Peraturan Menteri Kesehatan Republik Indonesia Nomor 74 Tahun 2016 Tentang Standar Pelayanan Kefarmasian di Puskesmas. 2016.
3. Robiyanto R, Aspian K, Nurmainah N. Keberadaan Tenaga Apoteker dan Evaluasi Pelaksanaan Pelayanan

Kefarmasian di Puskesmas Wilayah Kota Pontianak. J Sains Farm Klin. 2019;6(2):121.
4. Rasdianah N, Hiola F. Gambaran Penerapan Pelayanan Farmasi Klinik di Puskesmas. J Delima Harapan [Internet]. 2022;9(1):32–6. Available from: http://jurnal.akbidharapanmulya.com/index.php/delima/article/view/148/117
5. Hanggara RSL, Gibran NC, Kusuma AM, Galistiani GF. Pengaruh Keberadaan Apoteker terhadap Mutu Pelayanan Kefarmasian di Puskesmas Wilayah Kabupaten Banyumas. J Kefarmasian Indones. 2017;7(1):67–76.
6. Fadila N. Evaluasi Kinerja Pelayanan Farmasi Klinik di Puskesmas Kecamatan Sambas Kabupaten Sambas Provinsi Kalimantan Barat (Perbatasan RI-Malaysia). Universitas Muhammadiyah Yogyakarta; 2020.
7. Norcahyanti I, Hakimah F, Christianty FM. Evaluasi Pelayanan Kefarmasian di Puskesmas Kabupaten Ponorogo. J Islam Pharm. 2020;5(2):26–35.
8. Haris RNH, Indah A, Fudholi A, Satibi, Cahyadi A. Pengaruh Aspek Manajerial terhadap Pelayanan Farmasi Klinik di Puskesmas Kota Semarang. In: Seminar Nasional Teknologi Terapan Inovasi dan Rekayasa (SNT2IR). Sulawesi Tenggara: Program Pendidikan Vokasi Universitas Halu Oleo; 2019. p. 464–8.
9. Kurniasih FD, Amalia L, Anggraini Y. Analisis Mutu Pelayanan Farmasi di Unit Rawat Jalan Rumah Sakit X di Bogor. Soc Clin Pharm Indones J. 2016;1(1):89–106.
10. Dinas Kesehatan Kabupaten Kulon Progo. Profil Kesehatan Tahun 2021 (Data Tahun 2020). Wates: Dinas Kesehatan Kabupaten Kulon Progo; 2021.
11. Satibi, Prasetyo SD, Rokhman MR, Aditama H. Penilaian Mutu Pelayanan Kefarmasian di Puskesmas. Siti, editor. Yogyakarta: Gadjah Mada University Press; 2020.
12. Biro Tata Pemerintahan Setda DIY. Statistik Penduduk Daerah Istimewa Yogyakarta [Internet]. 2021 [cited 2022 Jun 13]. Available from: https://kependudukan.jogjaprov.go.id/statistik/penduduk/jumlahpenduduk/17/0/01/01/34.clear
13. Rusdi R, Warsito EB. Shift kerja dan beban kerja berpengaruh terhadap terjadinya kelelahan kerja perawat di ruang rawat di Rumah Sakit Pemerintah. J Manag Keperawatan. 2014;2(1):12.
14. Wardanis DT. Analisis Beban Kerja Tenaga Rekam Medis Rumah Sakit Bedah Surabaya Menggunakan Metode FTE. J Adm Kesehat Indones. 2018;6(1):53.
15. Melati K, Wigati P, Arso S. Analisis Beban Kerja Bidan Desa Di Puskesmas Duren Kabupaten Semarang. J Kesehat Masy. 2015;3(3):30–40.
16. Asbath R. Shift Kerja dan Beban Kerja Berpengaruh terhadap Terjadinya Kelelahan Kerja Perawat di Ruang Rawat di Rumah Sakit Pemerintah. Universitas Negeri Islam Maulana Malik Ibrahim Malang; 2017.
17. Sofiantika D, Susilo R. Hubungan Beban Kerja Dan Lingkungan Kerja Dengan Kejadian Kecelakaan Kerja Pada Perawat Ruang Rawat Inap Di RSUD Banyumas. J Keperawatan Muhammadiyah . 2020;(September):249–53.
18. Nurjanah S, sakka ambo, paridah paridah. Analisis Beban Kerja Tenaga Perawat di Instalasi Rawat Inap Rumah Sakit Umun Daerah (RSUD) Kota Kendari Tahun 2016. J Ilm Mhs Kesehat Masy Unsyiah. 2017;2(5).
19. Megawati F, Santoso P. Pengkajian Resep secara Administratif Berdasarkan Peraturan Menteri Kesehatan RI No 35 Tahun 2014 pada Resep Dokter Spesialis Kandungan di Apotek Sthira Dhipa. J Ilm Medicam [Internet]. 2017;3(1):12–6. Available from: https://media.neliti.com/media/publications/329103-pengkajian-resep-secara-administratif-be-79351a72.pdf
20. Jaelani AK, Hindratni F. Gambaran Skrining Resep Pasien Rawat Jalan Di Puskesmas Kota Yogyakarta Tahun 2015. J Endur Kaji Ilm Probl Kesehat. 2017;2(1):1–6.
21. Nursetiani A, Halimah E. Indentifikasi Persentase Kelengkapan Resep di Salah Satu Rumah Sakit di Kota Bandung. Farmaka. 2020;18(2):9–15.
22. Rochjana AUH, Jufri M, Andrajati R, Sartika RAD. Masalah Farmasetika dan Interaksi Obat pada Resep Racikan Pasien Pediatri: Studi Retrospektif pada Salah Satu Rumah Sakit di Kabupaten Bogor. J Farm Klin Indones [Internet]. 2019;8(1):42–8. Available from: https://jurnal.unpad.ac.id/ijcp/article/view/17732/pdf
23. Rusli. Farmasi Klinik [Internet]. Kementerian Kesehatan RI; 2018. Available from: http://bppsdmk.kemkes.go.id/pusdiksdmk/wp-content/uploads/2018/09/Farmasi-Klinik_SC.pdf
24. Ansel H, Stockton S. Pharmaceutical Calculation. 15th ed. Philadelphia: Wolters Kluwer Health; 2017.
25. Chaira S, Zaini E, Augia T. Evaluasi Pengelolaan Obat pada Puskesmas di Kota Pariaman. J Sains Farm Klin. 2016;3(1):35–41.
26. Rajiah K, Ting LC, Shan CS, Ming LY. Community Pharmacists' Perception on Patient Counseling and Continuing Pharmacy Education Program in East Malaysia. Malaysian J Public Heal Med [Internet].

2016;16(1):15–22. Available from: https://www.mjphm.org.my/mjphm/journals/2016 - Volume 16 (1)/COMMUNITY PHARMACISTS' PERCEPTION ON PATIENT COUNSELING AND CONTINUING PHARMACY EDUCATION PROGRAM IN EAST MALAYSIA.pdf

27. Ejeta F, Feyisa D, Kebede O, Aferu T, Siraj J, Feyissa D, et al. Medication Counseling Practices in Medicine Retail Outlets Found in Bench Sheko Zone, Southern Nations, Nationalities, and Peoples' Region, South West Ethiopia. Pragmatic Obs Res [Internet]. 2021;12:105–17. Available from: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8403070/
28. Badan Penelitian dan Pengembangan Kesehatan. Laporan Survei Indikator Kesehatan Nasional (Sirkesnas) 2016. Jakarta: Badan Penelitian dan Pengembangan Kesehatan, Kementerian Kesehatan RI; 2016.
29. Kemenkes RI. Petunjuk Teknis Standar Pelayanan Kefarmasian Di Puskesmas. Kementerian Kesehatan Republik Indonesia. 2019. 1–99 p.
30. Mardiana LA, Nuraini A, Aulia CD, Rahmah DR, Nurkhofifah, Awaliya SB. Evaluasi Penerapan Standar Pelayanan Kefarmasian Berdasarkan PMK No. 26 Tahun 2020 di Puskesmas Rawamerta Karawang. J Buana Farma [Internet]. 2021;1(4):46–51. Available from: http://journal.ubpkarawang.ac.id/mahasiswa/index.php/buanafarma/article/view/269/198
31. BPOM. Farmakovigilans (Keamanan Obat) : Panduan Deteksi dan Pelaporan Efek Samping Obat untuk Tenaga Kesehatan. Pus Farmakovigilans Nas [Internet]. 2019;1–26. Available from: https://e-meso.pom.go.id/web/useruploads/files/reference/5c88d7a5168fe_Buku Saku - Panduan Deteksi dan Pelaporan ESO untuk Tenaga Kesehatan.pdf
32. Aldhwaihi K, Schifano F, Pezzolesi C, Umaru N. A systematic review of the nature of dispensing errors in hospital pharmacies. Integr Pharm Res Pract [Internet]. 2016 Jan 12;5:1–10. Available from: https://pubmed.ncbi.nlm.nih.gov/29354533
33. Arikunto S. Prosedur Penelitian Suatu Pendekatan Praktik. Jakarta: Rineka Cipta; 2016.
34. Suyanto, Amal AI, Noor MA, Astutik IT. Analisis Data Penelitian: Petunjuk Praktis Bagi Mahasiswa Kesehatan Menggunakan SPSS. 1st ed. Semarang: UNISSULA Press; 2018.
35. Furqon. Statistika Terapan untuk Penelitian. 11th ed. Bandung: Alfabeta; 2018.
36. Misbahuddin, Hasan I. Analisis Data Penelitian dengan Statistik. 2nd ed. Jakarta: Bumi Aksara; 2014.
37. Marquish BL, Huston CJ. Leadership Role And Management Functions In Nursing Theory & Application [Internet]. 9th ed. Philadelphia: Wolters Kluwer Health; 2017. Available from: http://sbmu.ac.ir/uploads/marquis leadership roles and management functions in nursing theory and application 2017.pdf
38. Shao S-C, Chan Y-Y, Lin S-J, Li C-Y, Kao Yang Y-H, Chen Y-H, et al. Workload of pharmacists and the performance of pharmacy services. PLoS One [Internet]. 2020;15(4):e0231482. Available from: https://pubmed.ncbi.nlm.nih.gov/32315319/