Original Article

Prescribing and patient care indicators for drug use evaluation at primary healthcare centers in Indonesia

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ABSTRACT

Primary healthcare centers play an important role as the basic healthcare providers for communities before referral to hospitals, making evaluations of rational use of drug in such facilities essential. The study evaluated rational drug use based on WHO core drug use indicators at primary healthcare centers in West Java, Indonesia by using a cross-sectional design. A sample of 540 prescriptions written in January-December 2019 at five primary healthcare centers was obtained to evaluate prescribing indicators. Patient care indicators were evaluated at two primary healthcare centers in Depok by interviewing and observing 120 respondents. The prescribing indicator analysis illustrated that 3.50 ± 0.98 medicines were prescribed per encounter. In total, 99.25% of drugs were prescribed using the generic name, antibiotics were prescribed in 15.12% of encounters, injectable drugs were prescribed in 0.31% of encounters and 97.83% of medicines were prescribed from the National Formulary. In the patient care analysis, the mean duration of the medical consultation was 3.8 ± 1.8 min, and the mean dispensing time was 3.6 ± 2.0 min. Drugs were dispensed in 98.3% ± 12.9% of encounters, drugs were adequately labeled in 98.8% ± 5.5% of encounters and patients were aware of the correct dosage in 68.8% ± 38.4% of cases. Patient age ($p < 0.001$; $r = -0.511$) and education level ($p = 0.007$; $r = 0.346$) were correlated with their knowledge of drug information. Drug use in primary healthcare centers needs to be improved, especially concerning physician prescriptions and consultations as well as pharmaceutical care.

Keywords: Drug use, Rational, Patient care indicator, Prescribing indicator, WHO

Introduction

Rational drug use is increasingly being demanded to optimize health in the community. Rational drug use describes a situation in which patients receive drugs according to their clinical needs, in appropriate doses, for short periods, and at the lowest cost [1]. The World Health Organization (WHO) has developed standard indicators for assessing the rationality of drug use. According to research, these indicators have been recognized as a global standard for identifying problems and used by many developing countries [2-5]. The WHO standard indicators include prescribing, patient care, and facility indicators. These indicators can detect potential problems in drug use and help healthcare providers identify their priorities for improving rational drug use.

In previous years, research was conducted on drug use rationality based on prescription indicators at subdistrict healthcare centers in Depok City, Indonesia. The results revealed irrationality in the use of drugs based on several prescribing indicators [6]. Research on pharmaceutical service based on WHO patient service indicators were conducted at some primary healthcare centers between December 2016 and February 2017 in Depok City. The results illustrated that the WHO target scores were not achieved for most patient care indicators [7]. Irrational drug use reduces the quality of therapy, leading to increased morbidity and mortality, bacterial resistance, and unexpected drug reactions. Irrational drug use can be caused by several factors, including

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incorrect patient information and the actions of healthcare workers in terms of patient care. These incidents are detrimental to the patient, and they impede patient safety.Besides that, irrational use of medicine would lead to associated health risk such as morbidity,antibiotic resistance and also depletion of human and financial resources [8, 9].

Primacy healthcare centers in Indonesia organize public health efforts and first-level individual health efforts by prioritizing promotive and preventive efforts to achieve the highest public health status in their working areas. In 2014, the primary healthcare center accreditation system was implemented as a government effort to assess the performance of the facilities regarding patient services. This accreditation is expected to improve healthcare services. Because of this accreditation system, some primary healthcare centers have attempted to improve and increase their services in the last 3 years. Some efforts to increase the rationality of drug use were also performed by the government, such as training for healthcare providers.

In this study, we evaluated the rationality of drug use in primary healthcare centers with a focus on prescribing and patient service indicators based on the WHO guidelines. The results of this study are expected to help public healthcare centers analyze problems and improve the rationality of drug use.

Materials and Methods

Study design and setting

A facility-based quantitative cross-sectional study design was employed to evaluate rational drug use based on WHO core drug indicators. The prescribing indicator evaluation was conducted in five public healthcare centers in West Java (Beji, Limo, Pancoran Mas, Abadi Jaya, and Sukmajaya). The patient care indicator evaluation was conducted at two public hospitals in West Java (Pancoran Mas and Mekarsari). The study was conducted from January to July 2020. This study was granted institutional permission and ethical approval (Nos. Ket-320/UN2.F1/ETIK/PPM/00.02/2020 and Ket-318/UN2.F1/ETIK/PPM/00.02/2020) by the Ethics Committee of the Faculty of Medicine, University of Indonesia.

Sample collection

To evaluate prescribing indicators, prescriptions dispensed for 540 outpatients from January 2019 to December 2019 were investigated in the study. Via systematic random sampling, 108 outpatient prescriptions were selected. The mean number of drugs prescribed per encounter, percentage of generic drugs prescribed, percentage of prescriptions involving antibiotics, percentage of prescriptions involving injectable drugs, and percentage of prescribed drugs available in the Indonesian National Formulary were determined [10].

To evaluate patient care indicators, primary data were obtained from 60 respondents by observation and interview in two primary healthcare centers. In total, 30 respondents were evaluated to determine the mean medical consultation time. Another 30 respondents were analyzed to determine the dispensing time, actual drug dispensed, adequacy of drug labeling, and patient knowledge of drug information provided by pharmacist services. All enrolled respondents were at least 17 years old because this is the age limit of late adolescence, which is considered a sufficient age for conducting interviews. According to prior research, respondents aged 17 years can perform interviews related to the agreement, provide accountability for the words given and ensure that there was no confusion or misunderstanding about the interview questions given [11].

Data processing and analysis

Data were entered and selected by Microsoft Excel and analyzed using SPSS version 26.0. In addition to descriptive analysis, the Pearson–Spearman test was also used to analyze factors potentially correlated with patients' knowledge.

Results and Discussion

Prescribing indicators

The results for the prescribing indicators are presented in **(Table 1)**. The number of drugs prescribed per encounter exceeded the WHO standard (1.6–1.8) at all five centers (mean, 3.5 ± 1.0). Meanwhile, the percentage of generic drugs prescribed was excellent at the five health centers (mean, 99.3%), almost fulfilling the WHO criterion (100%). In addition, the rate of antibiotic prescriptions was also good at the centers (mean, 15.1%), complying with the WHO standard (<30%). Conversely, few injectable drugs were prescribed at the five healthcare centers (mean, 0.15%), as only one injectable drug, namely benzylpenicillin injection, was prescribed. Thus, the use of injectable drugs was rationally based on the WHO standard (<20%). In this study, the formulary used as a reference was the 2019 Indonesian National Formulary. WHO determined the optimal value for the percentage of drugs prescribed from the formulary is 100%. Based on the results of the study, this standard was not reached at any of the healthcare centers (mean, 97.8%).

The high number of items prescribed is a problem related to polypharmacy, which describes the simultaneous use of multiple drugs. Thus, polypharmacy in public healthcare centers can have negative effects, such as increased patient expenditures [9, 12], unwanted side effects [12-15], drug interactions [16-21], health-related quality of life [22, 23] and in compliance with the treatment [24-26]. In this study, polypharmacy was found in some patients with chronic diseases such as hypertension and diabetes mellitus. The use of combination regimens to treat chronic diseases is considered rational to prevent or treat potential complications [16, 22]. Polypharmacy was also observed in patients with an upper acute respiratory infection, for which antibiotics and symptomatic medicines such as analgesic, antipyretics, mucolytics, decongestants,

antihistamines, and corticosteroids are generally prescribed [27, 28].

Table 1. Distribution of Prescribing Indicators at Five Primary Healthcare Centers in West Java

Prescribing indicators	Primary healthcare center						
	WHO target	Beji (n = 108)	Limo (n = 108)	Pancoran Mas (n = 108)	Abadi Jaya (n = 108)	Sukmajaya (n = 108)	Mean
Mean number of drugs prescribed per encounter	1.6–1.8	3.3 ± 0.8	4.3 ± 1.1	3.8 ± 1.0	3.3 ± 0.8	3.1 ± 1.1	3.5 ± 1.0
Percentage of generic drugs prescribed	100%	100%	100%	99.3%	99.16%	98.5%	99.3%
Percentage of prescriptions with antibiotics	<30%	11.1%	6.5%	9.3%	17.6%	25.0%	15.1%
Percentage of prescriptions with injections	<20%	-	-	0.926%	-	-	0.15%
Percentage of prescribed drugs from the Indonesian National Formulary	100%	99.44%	96.95%	99.76%	97.77%	95.21%	97.83%

In Indonesia, most primary healthcare centers have prescribed generic drugs since the government implemented policies requiring healthcare facilities to provide generic drugs. The use of nongeneric medicines is usually permitted only when the generic version is not available in Indonesia. Other factors that might affect the use of generic drugs include the knowledge of patients or healthcare providers regarding the efficacy of generic medicines. Therefore, regulations requiring generic drug use are extremely important.

The observed compliance with the WHO standard regarding antibiotic use by the examined healthcare centers is expected to reduce problems related to increased antibiotic resistance. These findings illustrated that healthcare providers, especially prescribers, must have good awareness and concern about antibiotic resistance. This study also found that the percentage of prescriptions involving injectable drugs was optimal. Factors that influenced the low rate of injection prescriptions include the establishment of therapeutic standards and drug procurement regulations by the government, as well as increased knowledge among Indonesian healthcare workers and the public along with developments in the pharmaceutical industry in Indonesia regarding drug use.

Patient care indicators

Patients at two primary healthcare centers (Pancoran Mas and Mekarsari) were analyzed to assess patient care indicators. Most respondents seeking medical consultation and pharmacy services were female. Specifically, 24 respondents (80%) were female. Meanwhile, at Mekarsari, 22 respondents (73.3%) were female. At Pancoran Mas, 10 respondents (50%) had a senior high school education, in line with the results at Mekarsari (15 respondents [50%]). The results for patient care indicators are presented in **(Table 2)**.

The mean time for patient consultation is also presented in **(Table 2)**. The consultation time ranged from 1.16–8.11 min. The doctor's consultation time was far shorter than the standard set by WHO (>10 min). Concerning the dispensing time, it was determined that pharmaceutical personnel tended to rapidly provide drug information. This consultation time met the WHO recommendations of 3 min when more than two types of drugs were dispensed. The results also indicated that not all drugs prescribed by the doctor were dispensed. The results of the observation illustrated that patients knew the answers to at least four of the five questions asked about drug information. This percentage did not meet the WHO standard.

From **(Table 3)**, it is apparent that patient age had a strong negative correlation with the patient's knowledge of correct drug information. Specifically, the patient's knowledge decreased withincreasing age ($p < 0.001$; $r = -0.511$). Meanwhile, the patient's level of education had a moderately positive correlation with the patient's knowledge ($p = 0.007$; $r = 0.346$).

Table 2. Patient Care Indicators in Primary Healthcare Centers in West Java

Patient care indicators	WHO standard	Data obtained from primary healthcare centers		
		Pancoran Mas (n = 30)	Mekarsari (n = 30)	Mean
Medical consultation time (min)	10	3.7 ± 2.0	3.9 ± 1.5	3.8 ± 1.8
Dispensing time (min)	>3	3.0 ± 0.3	4.5 ± 2.7	3.6 ± 2.0
Actual drug dispensed (%)	100	96.6 ± 18.2	100.0 ± 0.0	98.3 ± 12.9
Adequate drug labeling (%)	100	97.5 ± 7.6	100.0 ± 0.0	98.8 ± 5.5
Patient's knowledge of correct drug information (%)	100	87.5 ± 12.7	41.7 ± 46.3	68.8 ± 38.4

Table 3. Correlation Between Patient Characteristics and Patient Knowledge of Drug Information

Associated factors	p-value	Spearman's correlation coefficient (r)
Age	<0.001	0.511
Level of education	0.007	0.346

Most respondents in the patient care indicator assessment were female. Decades of research have indicated that women are more likely to use health services than men, have more episodes of acute disease, and require more long-term care. Additionally, a study of gender differences in healthcare expenditures also revealed that 60% of medical expenditures and 59% of the total number of prescriptions were attributable to women [29]. In another study, women with diabetes mellitus also has higher health expenditure compare to men [30]. Most patients in this study were in the productive age group, possibly because they have risks of acquiring diseases from work and exertion [31].

Medical consultation occurs between doctors and patients to permit information exchange and optimize therapeutic decision-making [32]. According to research, longer consultations are generally associated with increased patient satisfaction. Responsiveness, friendliness, and attention are things that patients expect from a doctor [33]. Another study also found that patient poistive experience in health facility depended on physisican consultation, provision of information to patients, and also the environment of delivering services [34]. Based on the present observations, variations in the patient consultation time can be influenced by several factors, namely patient complaints, gender, and patient literacy.

The preparation and delivery of drugs are the main tasks of pharmaceutical personnel. The preparation and submission of regimens include reviews and interpretations of the regimens. The dispensing time in this observation might have been affected by the number of drugs prescribed, the time needed to provide drug information, and the experience of the pharmaceutical healthcare workers. In rare situations, pharmacists could not dispense all of the prescribed drugs. This might have occurred because the required drugs were not in stock, necessitating that patients obtain their prescriptions outside the primary healthcare centers. Sufficient drug labeling is achieved if the label contains at least the name of the patient, the name of the drug a disease indication, and the rules for using the drug. Drug labeling is necessary to reduce medication errors. Based on the present observations, incomplete drug labeling by pharmaceutical [35] personnel can be supplemented by verbally providing information. However, complete drug labeling is necessary for variations in patients' memory. According to a previous study, 40%-80% of the medical information provided by health practitioners is quickly forgotten, and the amount of information decreases as the amount of information provided is increased [36].

Drug information can be provided in written, oral forms, or also pictograms [37]. In this study, patient knowledge was observed regarding the drug name, the dosage form, the route of administration, information about food, and the frequency of drug administration. The factors associated with low patient knowledge in healthcare services include unclear drug information from the pharmacists, the readability of drug labels, and patients' previous knowledge about drugs.

In this study, two factors that might have contributed to patient knowledge were patients' age and education level. In other research, education influenced the relationship between patients' belief in the constitutional system and concerns for patient health. People with higher education levels pay more attention to their health and tend to take medication at the available healthcare services [34]. The readability of the drug label and the patient's knowledge of drug dosage instructions were related to the level of education and age of the patients. Similar studies reported that insufficient knowledge of drug information among patients was potentially related to the inability of patients to read and understand the drug dosage instructions on drug labels [38]. This was reinforced by other studies suggesting that the complex nature of drug regimens and age can also influence the readability and completeness of drug information [39].

Overall, the present findings indicated that medical consultation services provided by general practitioners and pharmaceutical services are not optimal. This might be attributable to the limited number of general practitioners and pharmacists in those facilities. Based on current regulations, the number of pharmacists needs to be increased according to the number of patient visits to both inpatient and outpatient services, and efforts should be exerted on the development of public healthcare centers. The numbers of pharmacy personnel and physicians are not sufficient compared to the number of prescriptions dispensed at each primary healthcare center. The lack of personnel could result in excessive workloads, thereby negatively affecting healthcare services.

Conclusion

Drug use in primary healthcare centers needs to be improved, especially concerning physician prescriptions and consultations as well as pharmaceutical care.

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