Rational Drug Use and Inventory Drug Management in The Peak of COVID-19 Pandemic in Indonesia

by Didiek Hardiyanto Soegiantoro

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ABSTRACT

The rational use of drugs is characterized by the appropriate diagnosis, treatment, the appropriate drugs, dosage and duration, the appropriate information and counseling, and evaluation of treatment responses. Panic buying for medications used in the treatment of COVID-19, including prescribed drugs, resulted from public panic prompted by the high fatality rate of COVID-19. The demand for COVID-19 prescribed pharmaceuticals without a prescription refers to irrational drug use and uncontrollable growth in demand that has caused drug supply management issues. From June to August 2021, researchers conducted an observational study employing a cross-sectional analysis method from several pharmacies in each region. The findings revealed a more than 2-fold rise in demand for COVID-19 medications without a prescription, resulting in a more than 3-fold increase in purchasing lead times, as well as a more than 3-fold increase in drug purchase costs that could be regulated with government selling price standards. This study concludes that at the peak of the COVID-19 pandemic, there was an increase in irrational demand due to people's indiscipline to use rational drugs, resulting in drug scarcity and uncontrolled price increases.

Keywords: rational drug use, purchasing lead time, cost of purchase, COVID-19, pharmacies

INTRODUCTION

No vaccines or medications have been viewed that have been displayed as powerful in taking care of COVID-19 (Narendrakumar et al., 2021). Exploration to observe antibodies and medications that are powerful in managing COVID-19 cannot stay aware of the speed of change of this infection. Different inconveniences remember contrasts for patient hereditary qualities and comorbidity that are boundless factors in the revelation of immunizations and medications for COVID-19 (Sharif and Dey, 2021). Clinical information for the therapy of COVID-19 is still extremely restricted. The patient's recuperation rate will not be quickly connected with the viability of the medication because many variables cannot be controlled during therapy. There are many factors, including utilizing a few mixes of medications and nutrients along with wellbeing supplements, non-clinical help treatment, mental elements, comorbid, ecological elements, and social elements from patients and their families (Heyden and Parkin, 2020).

World Health Organization (WHO) characterized sane medication use as patients get medicines proper to their clinical necessities, in portions that meet their special prerequisites for a satisfactory timeframe, at the most minimal expense for them and their local area (Aravamuthan et al., 2019). WHO created center and correlative medication use pointers to assess medication use in medical care settings. Among these, the center medication use markers have been considered the primary line pointers approved by WHO for estimation of medication use. The center medication use markers are more instructive, more doable, more averse to vary over the long haul and spot, and more straightforward to quantify drug use than the essential pointers. This way, the center pointers have been chosen for a better quantitative assessment of levelheaded medication use. There are three significant classifications of center medication use pointers, endorsing markers (average number of medications per experience; level of medications recommended with a nonexclusive name; level of experiences with anti-toxins prescribed, level of experiences with infusions prescribed, and level of medications recommended from EDL), patient consideration markers (normal discussion time, normal administering time, level of medications apportioned, level of medications truly named and patient information on the best way to take the medication), and wellbeing office pointers which are accessibility of fundamental medications, accessibility of STGs, models and EDLs (Sisay et al., 2017).

An Indonesian government program called GeMa CerMat, or the proper utilizing drugs, was sent off by the Indonesian Ministry of Health before the COVID-19 pandemic, since 2015, with the number HK.02.02/MENKES/427/2015. This program intends to expand public mindfulness in utilizing drugs and smother silly medication. This development is a coordinated effort between the public authority and the local area, which is appeared in a progression of exercises to shape mindfulness, mindfulness, comprehension, and abilities of the local area in utilizing drugs properly and accurately. This program has been ordered to the degree of essential medical services, particularly Puskesmas, in each little region (Mursiti et al., 2020). Reasonable medication use is one of the GeMa CerMat programs which has markers: the exactness of evaluating the patient's condition, the right determination, the right sign, the right medication, the right portion, the right technique and term of organization, the right data, considering reasonableness, patient consistency, and sharpness. Secondary effects. Drugs in light of their availability can be isolated into three classifications, drugs that can be purchased anyplace, drugs that can be purchased in drug stores or pharmacies (over-the-counter medications), and medications that must be gotten with a prescription (prescribed drugs). Recommended drugs in Indonesia are still frequently exchanged without a remedy, so it is truly conceivable without a clinician's appraisal as far as the proper evaluation of the patient's condition, the right analysis, the right sign, and the right medication. Given the information from the Health Research Project from the Indonesian Ministry of Health in 2013, 35.2% of families have a medication for self-drug. 35.7% of them kept prescribed drugs, with 27.8% incorporating antibiotics. The quantity of anti-infection agents claimed without a solution is 86.1% throughout each Indonesian family. Through the GeMa CerMat program, it is trusted that the public will be more watchful and cautious in picking and utilizing drugs. While purchasing a medication, everybody is relied upon to have the option to peruse the data contained in the medication and do not simply utilize tranquilizers thoughtlessly without going through a fair appraisal. The job of specialists in surveying the patient's condition, laying out a determination, deciding signs, and picking the right medication should

not be disregarded by the local area. It is not suitable 100% of the time for everybody to utilize a similar medication even though they experience similar manifestations of sickness since everybody's condition is unique and the side effects that emerge can be brought about by more than one illness (Komala et al., 2019).

The Indonesian Ministry of Health has set the COVID-19 administration convention, and the subsequent release has been substantial since July 2021. The COVID-19 convention partitions four classifications: asymptomatic, gentle-grade manifestations, moderate-grade indications, and serious or basic side effects. Each gathering has disengagement and observing conventions, non-pharmacological treatment, and pharmacological treatment. All classifications got a pharmacological treatment of L-ascorbic acid and vitamin D. The gentle indication got extra Azithromycin 1 x 500 mg every day for five days and antiviral Oseltamivir (Tamiflu) 75 mg/12 hours/oral for 5-7 days or Favipiravir (Avigan arrangement 200 mg) stacking portion 1600 mg/12 hours/oral on the first day and afterward 2 x 600 mg (days 2-5). In the interim, for moderate indications, the side effects are equivalent to for gentle manifestations, except for antivirals, Favipiravir (Avigan 200 mg readiness) is utilized, a stacking portion of 1600 mg/12 hours/oral on the first day and afterward 2 x 600 mg (days 2-5) or Remdesivir 200 mg IV trickle (day 1) trailed by 1x100 mg IV dribble (day 2-5 or day 2-10). Moreover, pharmacological treatment is given by suggestive manifestations, for instance, Paracetamol assuming you have a fever (Kementerian Kesehatan R.I., 2021).

The COVID-19 treatment convention does not restrict specialists and drug specialists in implementing the sane utilization of medications. In this way, suggestive treatment of comorbid and intricacies are referenced toward the finish of every convention. Doctors can give extra medications if different pharmacological treatment is required in surveying the patient's condition. Consequently, some doctors prescribed antibiotics, anti-inflammations, antidiarrheals, secretolytics. The issue of unreasonable medication use will assume the specialist's solution is considered exceptionally viable because it is right as indicated by the patient's condition, yet it is then repurchased and utilized by an alternate patient. Occurrences of utilizing specialist's remedies by various patients are extremely normal in Indonesia since it is imagined that if the solution is exceptionally powerful for one persistent, it can likewise apply to different patients. The outcome is that a specialist's solution will turn into a web sensation on open web-based media to become heavenly medication and even be consumed not so much for therapeutic purposes but rather for avoidance. The medications for these medicines that are viral via web-based media come from more than one specialist. They are consolidated so that one remedy contains more than one antiviral, more than one anti-microbial, and more than one medication for a similar suggestive treatment. This study aims to evaluate rational drug use from prescribed drugs for COVID-19 medication that happened during the peak of the COVID-19 pandemic in June-August 2021.

The issue in this study is to outline the information on the increasing purchasing of prescribed COVID-19 medications during the pandemic's peak from June to August 2021. There will be an impact on drug supply management in community pharmacies. There is a shortage of drugs marked by an increase in buying lead times and purchase costs because of the interest and supply hypothesis. The benefit of this research is to provide an overview for the government to evaluate the GeMa CerMat program to impact rational drug use in the future positively.
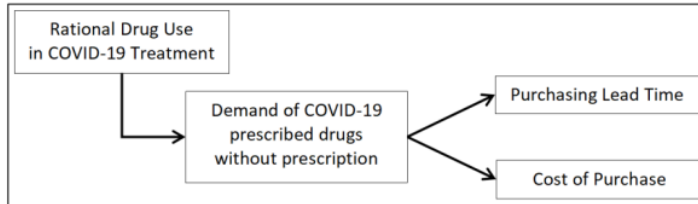
METHODS

Fig 1. Design Research and Variables

This research is an observational study using a cross-sectional method. The study was conducted from June to August 2021, considering the peak time of the COVID-19 pandemic. Data were taken from selected pharmacies from each district. Data on pharmacies and pharmacists were obtained from the provincial health office and cross-checked with the human resource information system from the Indonesian Ministry of health. The sample was determined randomly from the data, and then an informed consent form was given as a form of research ethics. Pharmacists who have filled out informed consent are given several questions online by filling out a google form.

The types of drugs studied were Oseltamivir 75 mg orally, Favipiravir 200 mg orally, Azithromycin 500 mg orally, Dexamethasone 0.5 mg orally, Acetylcysteine, and other prescription drugs. The rationality of drug use is measured by the percentage of requests for prescription drugs without a doctor's prescription compared to those using a doctor's prescription. Availability of drugs is assessed based on the lead time since the order is made until it is shipped. The selling price is assessed based on the average net pharmacy price (HNA) in June, July, and August 2021. Data analysis uses a cross-sectional multivariate approach, with the independent variable being the percentage of purchases of COVID-19 drugs without a prescription and the dependent variable on purchasing lead time and the cost price of the drug.

RESULT AND DISCUSSION

The data was taken from selected pharmacies with the criteria of being in each city and district area and providing drugs for the COVID-19 pharmacology treatment.

Table 1. Data Sources from Pharmacies

Regional	Number of Pharmacies Used as Data Sources
Sumatera Island	154
Java Island	219
Nusa Tenggara and Bali	41
Kalimantan Island	56
Sulawesi Island	81

Maluku Islands	21
Papua Island	42

Self-medicine for COVID-19 utilizing prescribed drugs without a prescription is one sign of irrational drug use. It does not go through the proper appraisal process to evaluate the patient's condition, the right determination, and the good sign of the right medication (Komala et al., 2019). This study took information on the number of prescribed drugs bought with and without a prescription.

Table 2. Average Demand of Prescribed Drug

Prescribed Drug	June 2021		July 2021		August 2021	
	With	Without	With	Without	With	Without
Oseltamivir	0.75	1.00	2.12	6.70	3.68	12.32
Favipiravir	1.12	1.40	2.07	7.54	2.95	9.69
Azithromycin	0.48	0.65	2.71	10.32	6.41	19.68
Dexamethasone	3.00	6.65	6.56	13.52	5.01	12.35
Acetylsisteine	1.21	1.65	4.45	18.40	9.58	25.69
Other Prescription drugs	21.08	38.49	56.85	268.45	59.73	249.86

Table 2 shows that the demand for prescribed drugs purchased without a prescription is much greater than those purchased by prescription. This result shows that people have not been properly educated on the importance of rational drug use. Dewi and Juliadi (2021) found that several factors influence sales behavior and the use of prescribed drugs without a prescription: ease of access to prescribed drugs, cost savings, patient attitudes, and recommendations from friends or relatives. In comparison, the research of Prasetyo and Ayu (2021) found that the absence of fair law enforcement caused the sale of prescribed drugs without a prescription.

Self-medication from prescribed drugs is a high risk of getting the wrong medication because it is not a proper assessment. Medication errors can harm health quality increase the risk of unwanted drug side effects, dangerous drug interactions, and other negative impacts (Lima et al., 2017). Self-medication that aims to treat disease will even risk increasing the severity of the illness. These results are in line with research conducted by Soleha et al. (2019) on the purchase of non-steroidal anti-inflammatory drugs (NSAIDs) in 33 provinces. That research found that the province of East Java had the highest profile of non-prescription purchases in Indonesia, which were purchased from pharmacies and convenience stores.
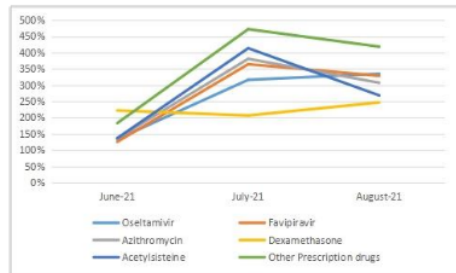
Fig 2. Percentage Demand of Prescribed Drugs without Prescription

Figure 2 shows an increase in the percentage of demand for prescribed drugs without prescription due to panic buying. Public social media is filled with information on drugs used for COVID-19 treatment. On the other hand, there has been a very high daily increase in positive cases with a high death rate, so public fear has led to high demand for COVID-19 drugs. The rational drugs use was very low because the drugs mentioned in the COVID-19 management protocol were not used for COVID-19 treatment therapy but prevention. As a result, patients who were supposed to get the drugs could not get them, but other people who did not need the drugs could instead get and keep the drugs themselves.

Suryaningsih et al. (2021) confirmed the irrational use of vitamin C during the COVID-19 pandemic by 84.73%. Suhardiman et al. (2021) found that irrational drug use was more common in COVID-19 patients who were self-isolating than those treated in integrated isolation shelters or hospitals because medical personnel supervised drug use. The role of community pharmacists in pharmacies is very important during the COVID-19 pandemic because they are required to be able to provide education to the people to be able to carry out COVID-19 self-medication therapy appropriately, effectively, and safely (Derqui et al., 2021; Lin and Zhang, 2020; Liu et al., 2020; Lopez et al., 2021).
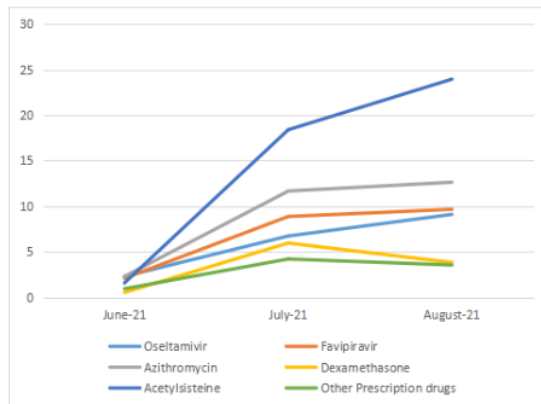
Figure 3. Purchasing Lead Time

In June 2021, panic buying did not occur; therefore, the availability of drugs at pharmaceutical distributors can still serve the needs of health facilities that directly serve the community. Late June to early August is a critical period where all hospitals can no longer accommodate patients. Most COVID-19 patients are treated at home; therefore, medical practitioners' demand for COVID-19 medicines is very high, not even rare. Patients ask for prescriptions from doctors not because of illness but for supplies at their homes. The drug industry cannot meet the very high demand for medicines over time, which is not ready for the sudden high demand. Therefore, the purchasing lead time of COVID-19 drugs in July 2021 increased many times. Drug orders are usually sent directly within 2-3 days. At that time, it was sent for more than two weeks due to not being available at pharmaceutical distributors, as shown in Figure 3.
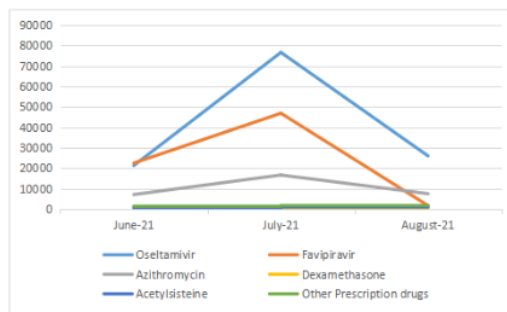

Figure 4. Cost of Purchase

The theory of supply and demand also applies to drugs. The demand for COVID-19 drugs that increased instantly in just a few days caused a shortage in the pharmaceutical market. The pharmacy industry may not be able to meet this demand in a short time because the production process requires good manufacturing practice (GMP) requirements, where there is a standardized process starting from the supply of raw materials to distributing in pharmaceutical distributors, which takes several weeks. The limited human resources in the drug industry due to regulations on limiting work shifts prolong the production process. If workers are infected with COVID-19, the work area must be disinfected first so that the production process stops. Many production constraints occur so that demand becomes very high while the amount of supply decreases. This matter led to a very high increase in drug prices in July 2021, as shown in figure 4. In response to the uncontrollable price of these drugs, the Indonesian Ministry of Health issued the highest standard retail price of drugs so that they were finally able to control the selling price of drugs again in August 2021 even though they did not return at the same price as in June 2021.

CONCLUSION

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The peak of the COVID-19 pandemic led to an increase in the irrational use of drugs for the types of prescribed drugs used in COVID-19 therapy guidelines. The Indonesian government's GeMa CerMat program fails to educate the dangers of drugs if they are not used rationally. This matter is shown from the data on the increase in demand for purchasing drugs without a prescription which is very high and impacts drug supply management in community pharmacies. The pharmaceutical industry cannot meet the very high and sudden increase in demand, resulting in a shortage of drugs in pharmaceutical distributors and increasing the purchase lead time of drugs. Likewise, this impacts increasing drug prices due to an imbalance in demand and supply. The government can finally control the very high increase in drug prices in August 2021 with the highest retail price standard. The Indonesian government needs to modify the GeMa CerMat program, which has been a program of the Ministry of health and expanded to become a program for all ministry departments so that it can be applied in every social activity.

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