

Research Article

Pharmacists' willingness to administer COVID-19 vaccine: A survey from Yogyakarta community pharmacists

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ABSTRACT

The global focus for reducing cases during this pandemic is COVID-19 vaccination. The purpose of this study is to investigate community pharmacists' perceptions and identify factors that influence their willingness to administer the COVID-19 vaccine. A self-administered online survey based cross-sectional study was conducted in Yogyakarta Province. The questions were created using existing questionnaire from the literature, then validated and pilot tested on a group of pharmacists. This study included pharmacists from community pharmacies. Descriptive and logistic regression analysis were used. An online survey was completed by 120 pharmacists from community pharmacies, including 58 chief pharmacists and 62 companion pharmacists. Most participants agreed on several points concerning the role, benefits, enablement, and barriers of pharmacists providing vaccinations. Our study also discovered that the willingness of community pharmacists to administer COVID-19 vaccine was significantly related to age (under 40 years old), working experience (under 10 years), pharmacy location (urban area), distance from health facilities (under 5 kilometers), and availability of service for universal health coverage (UHC) patients. The majority of community pharmacists had positive attitudes about providing COVID-19 vaccines. It is hoped that the new role of community pharmacists as vaccinators will help to accelerate COVID-19 vaccination coverage in Indonesia.

Keywords:

Community pharmacist, Vaccination service, COVID-19

1. INTRODUCTION

The COVID-19 pandemic caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) is a major threat worldwide, particularly in Southeast Asian countries¹⁻³. Vaccine development is the global focus for reducing this disease, as vaccination is one of the most effective protection strategies against viral infections⁴. This is essential in implementing the ASHP principles for the COVID-19 vaccine: distribution, allocation, and mass immunization, which lead to herd immunity, reducing disease spread, and restoring normalcy⁵. Global vaccination coverage may be required to halt the COVID-19 pandemic. However, the demand for vaccines in low- and middle-income countries has received less attention when compared to high-income countries⁶. The effectiveness of the COVID-19 vaccination has an impact on its accep-

tance in Indonesia⁷.

Pharmacists are an important part of the health-care system, and their role in the coronavirus pandemic control cycle is crucial⁸⁻⁹. Several international studies have emphasized the need of community pharmacists expanding their position and engaging in immunization programs¹⁰⁻¹¹. Many pharmacists are participating in the COVID-19 vaccination on a global scale, assisting in the distribution and allocation of the vaccine as well as enabling mass vaccination as vaccinators¹⁰. In addition, community pharmacists are the most accessible health-care professionals through community pharmacies, serving as the patient's first point of contact for many of their healthcare needs, in terms of both educational and pharmaceutical services. Accessibility has a significant positive impact on vaccine coverage¹¹. Positive information-seeking behaviors and trust in medical and health professionals

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were linked to a higher likelihood of vaccine uptake¹². Trained pharmacist vaccinators should be included in health workforce planning in order to achieve herd immunity through rapid and large-scale COVID-19 vaccination¹³. As an outcome, if community pharmacists are given the authority to provide COVID-19 vaccination, it is expected that vaccine coverage will increase in Indonesia.

The present study aimed to explore community pharmacists' perceptions toward administering the COVID-19 vaccine as vaccinator and to identify the factors that influence pharmacists' willingness to administer COVID-19 vaccine in Yogyakarta Province, Indonesia.

2. METHODS

An online survey based on a cross-sectional study was conducted from March to April 2021. Pharmacists from community pharmacies in Yogyakarta Province were eligible for this study. We used pharmacist groups on social media as distribution channel. The survey received approval from the human research ethics boards of the Gadjah Mada University with approval number KE/FK/1023/EC/2021.

We set the margin of error at 5% with a 95% confidence level to calculate an adequate representative sample from the intended population. Sample size calculation for cross-sectional study used proportion of willingness to participate the vaccination based on previous study, based on formula¹⁴:

$$\text{Sample size} = z^2 p(1-p)/d^2,$$

where: z is variate at 5% type I error (1.96), p is expected proportion of willingness to participate the vaccination based on previous study (0.5), and d is absolute error (10%). Because there are 953 community pharmacists in Yogyakarta, a sample size of 120 was estimated.

The questionnaire was created after a thorough examination of the existing literature and a focus group discussion with practicing pharmacists. The questionnaire, including both closed-ended and open-ended questions with predetermined answers, were divided into three sections: the first assessed sociodemographic data (age, gender, marital status, specialty, years of experience working as a pharmacist, and community pharmacy characteristics), the second assessed vaccine administration perceptions (Q1-Q12 close-ended questions) based on a five-point Likert scale (1: strongly disagree; 5: strongly agree). List of questions are detailed as follow: Q1 Educate and inform patient about benefit of COVID-19 vaccination; Q2 Counteract disinformation of COVID-19 vaccination, Q3 Accelerating the COVID-19 vaccination coverage as vaccinator, Q4 Involve in COVID-19 distribution and logistics, Q5 Make it easier for patients to get COVID-19 vaccine, Q6 Enhance trust between pharmacist and patient, Q7 Aiding the healthcare system during

pandemic, Q8 Support from Indonesian Pharmacists Association, Q9 Lack of training and skills in vaccination, Q10 Not confident in vaccination, Q11 Other health professionals collaboration, Q12 Regulation for pharmacists to provide vaccination. The third section assessed willingness to administer COVID-19 vaccine in community pharmacies (yes-no questions).

To examine the clarity, understandability, and relevance of the survey items, a pilot test was done on 20 community pharmacists (5 in each district) who were not included in our sample. Their feedback was crucial in ensuring the survey's face content validity and obtaining the final version of the questionnaire.

Data analysis was performed using SPSS 21 version. For continuous variables, mean and standard deviation were used, while for categorical variables, number and proportion were used. The adjusted odds ratio (AOR) was calculated on multivariate analysis to determine the factors influencing the willingness of administering vaccines in community pharmacies. For each predictor, the 95 percent confidence interval (CI) was calculated. Results with $p < 0.05$ were deemed significant.

3. RESULTS

A total of 120 pharmacists from Yogyakarta pharmacies participated in this study, including 58 chief pharmacists and 62 staff pharmacists. Table 1 depicts the characteristics of pharmacists. The respondents' average age was 45.32 ± 12.11 years, with 85% being female. The vast majority of respondents held a pharmacist degree (90.83%) and had 5-10 years of experience (46.67%). The pharmacies where respondents practiced were independent pharmacies (76.67%), in urban areas (65.00%), and less than 5 kilometers from healthcare facilities (52.50%). The most of pharmacies served universal health coverage (UHC) patients (71.67%), and providing 50-100 patient services per day (40.00%). The large proportion of community pharmacists (80.00%) were willing to administer the COVID-19 vaccine, while the remainder were not.

Table 2 summarizes the means and standard deviations for pharmacist perceptions of COVID-19 vaccination. The participants showed the highest score to the pharmacist's role in providing education and informing the benefits of the COVID-19 vaccine (3.78 ± 1.21), followed by counteracting disinformation about the COVID-19 vaccine (3.56 ± 1.1), accelerating COVID-19 vaccination coverage as vaccinator (3.49 ± 1.2), and being involved in COVID-19 vaccine distribution and logistics (3.47 ± 0.98).

The COVID-19 vaccination has numerous advantages. Vaccination by pharmacists, according to respondents, can make it easier for patients to obtain the COVID-19 vaccine (3.54 ± 0.54), whereas vaccination services in Indonesia are currently limited to hospitals and

Table 1. Characteristics of pharmacists (N=120).

Variable	Category	N	%
Gender	Female	102	85.00
	Male	18	15.00
Age (mean. SD)		45.32	12.11
Degree of education	Pharmacist degree	109	90.83
	Master degree	11	9.17
Position*	Chief pharmacist	58	48.33
	Staff pharmacist	62	51.67
Working experience	<5 years	35	29.17
	5-10 years	56	46.67
	>10 years	29	24.17
Types of pharmacies	Independent pharmacy	92	76.67
	Chain pharmacy	28	23.33
Location	Urban	78	65.00
	Rural	42	35.00
Distance from health facilities	<5 km	63	52.50
	5-10 km	57	47.50
Provide service for UHC patients	Yes	86	71.67
	No	34	28.33
Number of patient service per day	<50 patients	32	26.67
	50-100 patients	48	40.00
	101-200 patients	40	33.33
Willing to administer the Covid-19 vaccine	Yes	96	80.00
	No	24	20.00

Table 2. Roles and barriers' perception related to COVID-19 vaccination by pharmacists.

Domain	Items	Mean	SD
Roles	Educate and inform patient about benefit of COVID-19 vaccination	3.78	1.21
	Counteract disinformation of COVID-19 vaccination	3.56	1.10
	Accelerating the COVID-19 vaccination coverage as vaccinator	3.49	1.20
	Involve in COVID-19 distribution and logistics	3.47	0.98
Benefits	Make it easier for patients to get COVID-19 vaccine	3.54	0.54
	Enhance trust between pharmacist and patient	3.57	1.19
	Aiding the healthcare system during pandemic	3.47	1.21
Enabling	Support from Indonesian Pharmacists Association	3.74	1.32
Barriers	Lack of training and skills in vaccination	3.84	1.13
	Not confident in vaccination	3.64	1.04
	Other health professionals collaboration	3.56	1.09
	Regulation for pharmacists to provide vaccination	3.74	1.11

health centers and are performed by medical personnel such as doctors and nurses. If pharmacists help administer vaccines, it will build trust between pharmacists and patients (3.57 ± 1.19) while also assisting the health system during the pandemic (3.47 ± 1.21).

Respondents agreed (3.74 ± 1.32) that the Indonesian Pharmacists Association's approval is required to make pharmacist vaccination a reality. Pharmacists face a number of challenges when it comes to COVID-19 vaccination. Respondents agreed on the lack of training and skills in administering vaccines (3.84 ± 1.13), as well as their lack of confidence in administering vaccinations directly to patients (3.64 ± 1.04). Collaboration with other health workers (3.56 ± 1.09), such as doctors, is also a barrier for pharmacists. Finally, the regulation for pharmacists to provide vaccination remains unclear, and respondents

agreed with this statement (3.74 ± 1.11).

Table 3 describes the relationship between pharmacist characteristics and willingness to administer the COVID-19 vaccine. Respondents who were 40 years old and had 10 years of work experience were two and one-third times more likely to have a positive attitude toward administering the COVID vaccine (OR=2.33, 95% CI 1.23-4.37 and OR=2.31, 95% CI 1.11-4.29, respectively). Pharmacists with pharmacies in urban areas, less than 5 kilometers from health facilities, and who serve UHC patients are more likely to administer vaccines (OR=2.31, 95% CI 1.10-4.37, OR=2.43, 95% CI 1.32-4.74 and OR=2.31, 95% CI 1.28-4.29, respectively) than pharmacists with pharmacies in rural areas, more than 5 kilometers from health facilities, and who do not serve UHC patients.

Table 3. Association between characteristics of pharmacists and willingness to administer COVID-19 vaccine.

Variable	Category	OR	CI
Gender	Female	1.23	0.57-2.11
	Male	1	
Age	<40	2.33*	1.23-4.37
	>40	1	
Degree of education	Pharmacist degree	1.12	0.68-2.21
	Master degree	1	
Working experience	<10 years	2.31*	1.11-4.29
	>10 years	1	
Types of pharmacies	Independent pharmacy	1.19	0.75-2.38
	Chain pharmacy	1	
Location	Urban	2.31*	1.10-4.37
	Rural	1	
Distance from health facilities	<5 km	2.43*	1.32-4.74
	5-10 km	1	
Provide service for UHC patients	Yes	2.31*	1.28-4.29
	No	1	
Number of patient service per day	≤100 patients	1.24	0.73-2.35
	>100 patients	1	

*Significant at $p < 0.05$

4. DISCUSSION

This study found that community pharmacists in Yogyakarta had positive attitudes toward administering the COVID-19 vaccine in community pharmacies. During an emergency, such as the COVID-19 pandemic, pharmacists play an important role in community pharmacies as well as healthcare facilities. For patients in need of reliable information and advice, pharmacies are both the first and last point of contact⁵. The community pharmacies were an excellent place to promote public health¹⁵. Community pharmacists who have been adequately educated and informed about vaccination can play an important role in vaccination offering and counseling¹⁶, in this case by providing education about the benefits of COVID-19 vaccine. As a result, pharmacists can aid in the reduction of COVID-19 vaccine-related misinformation and the growth of COVID-19 vaccination coverage. There was a significant relationship between information from health professionals, level of knowledge, and vaccination¹⁷. The key driver of decreasing vaccine trust was disinformation on the topic of vaccination offered by some mass media and social media¹⁸. Integrating community pharmacy services into national vaccination programs can help raise awareness among populations, particularly at risk and vulnerable populations, by encouraging vaccine uptake and increasing vaccination coverage rates, thereby counteracting the spread of prejudice and unreasonable skepticism¹⁹. Pharmacists also play a vital role in the vaccination process because they store vaccines in pharmacies, deliver vaccines to physicians, prepare antitoxins for administration, and distribute vaccines²⁰. Later in the twentieth century, pharmacists evolved into vaccine

educators and promoters of vaccine services²¹.

The results from this study showed that the administering COVID-19 vaccine by community pharmacists could help patients get vaccine easily. As we all know, when health care facilities close, community pharmacies remain open to provide services and medication. Furthermore, pharmacists administering the COVID-19 vaccine could increase trust between pharmacists and patients. A number of previous studies revealed similar pattern that providing immunization services allows them to improve their relationship with their patients and get to know them better²²⁻²³, resulting in trust. The implementation of community pharmacy-based immunization services could be aided by patients' and pharmacists' trusting relationships²³. Because ease of access is a theoretically changeable determinant, increasing the variety of places in which individuals can receive vaccines will likely increase the number of accessible opportunities for immunization, resulting in higher vaccine coverage rates²⁴⁻²⁵. Increasing access to and the convenience of pharmacy vaccination could increase vaccination coverage²⁶.

Our study also discovered that community pharmacists' willingness to administer COVID-19 vaccine was significantly associated with age (under 40 years old), working experience (under 10 years), pharmacy location (urban area), distance from health facilities (under 5 kilometers), and availability of service for UHC patients. In terms of UHC services, community pharmacists can help achieve UHC by ensuring access to high-quality services without exposing individuals to financial hardship or out-of-pocket (OOP) expenses²⁷.

The first important strategy is to increase pharmacies' involvement in vaccine implementation by

encouraging pharmacists as a profession to participate in vaccination activities²⁸. Pharmacists are suitable for this role because they are already knowledgeable in many aspects of medication management, including taking medication histories, counseling, and managing adverse effects²⁹⁻³¹. In this case, community pharmacists must enhance their knowledge and skills in order to become vaccinators. According to the American Society of Health System Pharmacists (ASHP), skills training for vaccination competency includes vaccine administration, such as dosing and injection techniques; vaccine procurement, such as transportation, storage requirements, and vaccine stability; vaccine safety, such as patient screening for contraindications, adverse reactions, interactions, and emergency procedures; and vaccine documentation³².

Aside from all of the roles and benefits of pharmacists in administering COVID-19 vaccination, the Indonesian Pharmacist Association's role in supporting the implementation of pharmacist-administered vaccination is critical. The main barriers to pharmacists administering COVID-19 vaccine were a lack of pharmacist training and skills, regulation and liability, a lack of confidence, and other health professionals' perceptions of pharmacists vaccinating. Prior studies concluded that the major barrier is a lack of regulation governing pharmacist immunization, followed by a lack of competency, a lack of skill training, a lack of equipment, and a high workload on conventional services³³. Argentina and Mexico have specific laws governing vaccination in pharmacies³⁴. The United Kingdom, Portugal, and the United States provide evidence that policy changes are effective in increasing immunization rates³⁵. This evidence should persuade the Indonesian government to implement pharmacist-administered vaccination policies. Despite efforts in the form of regulations and training, political and organizational gaps must be addressed properly in order to further strengthen sustainability and the role of pharmacists as vaccinators³⁶.

The first descriptive study to investigate community pharmacists' perceptions of administering COVID-19 vaccine in Indonesia has several limitations. First, because our sample only included community pharmacists in Yogyakarta province, the results may not reflect the overall perception of community pharmacists in a single nation. As a result, future studies for samples in each province of Indonesia are required. Second, because the survey was conducted online and independently, it had limited control over respondents and a double count of respondents.

5. CONCLUSION

The majority of community pharmacists had positive perceptions about providing COVID-19 vaccination services. This study found that the Indonesian

Pharmacist Association's support is critical in realizing the regulation and liability of pharmacist-vaccination services. In addition, pharmacists must be trained and have the necessary skills to administer the vaccine. The presence of a pharmacist vaccination program is expected to increase COVID-19 vaccination coverage during this pandemic.

Conflict of interest

The authors declare that they have no conflict of interest.

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None to declare.

Ethics approval

The survey received approval from the human research ethics boards of the Gadjah Mada University with approval number KE/FK/1023/EC/2021.

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