The Effect of Knowledge and Experience on the Readiness of Pharmacists' Practices During the COVID-19 Pandemic

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Abstract. During the COVID-19 pandemic, all elements of medical personnel, including pharmacists, are required to provide comprehensive pharmaceutical services in the context of preventing and controlling COVID-19. This study was aimed to find out the effect of knowledge and experience on the readiness of pharmacists' practices in pharmacies during the COVID-19 pandemic era. This study used a cross-sectional analytic observational method which sample was pharmacists practicing in pharmacies in East Java, Indonesia (n = 115). The instrument was a questionnaire distributed online consisting of knowledge, experience, and readiness questionnaire. Data were analyzed by multiple linear regression method using SPSS 25 (5G6HJ-876H5-GF4D3-23X4F-789PLK). The result indicates that knowledge and experience simultaneously had a significant effect on pharmacist practice readiness (p = 0.000). Knowledge partially had a significant effect on pharmacist' practice readiness (p = 0.000). Experience partially had no significant effect on pharmacist' practice readiness (p = 0.306). Thus, it was concluded that there is a significant positive effect between knowledge and experience on the readiness of pharmacists' practices at pharmacies in East Java during the COVID-19 pandemic.

Keywords: pharmacist · knowledge · experience · readiness · COVID-19

1 Introduction

Since the beginning of 2020, the world has been shocked by the emergence of Sars-Cov-2. Severe Acute Respiratory Syndrome Coronavirus 2 (Sars-CoV-2) is a new type of virus that causes Coronavirus Disease-19 (COVID-19). WHO announced COVID-19 outbreak as Public Health Emergency of International Concern (PHEIC) on 30 January 2020 which subsequently changed its status to pandemic on 11 March 2020 considering that nearly 200 countries in the world have been infected, including Indonesia [1]. COVID-19 can be transmitted very quickly through direct contact, the environment or objects contaminated with viruses, respiratory droplets, and airborne particles [2].

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In East Java, Indonesia, as of 6 September 2021, there were 387,421 total confirmed cases included 7,520 active cases and 28,760 deaths cases. The number of cases continues to change following development of data and information from the East Java Province COVID-19 Task Force [3].

During the COVID-19 pandemic, all elements of medical personnel, including pharmacists, pull together to improve their readiness for being the forefront fighter of COVID-19 outbreak [4]. The role of pharmacists in dealing with the COVID-19 pandemic includes: ensuring the availability of personal protective equipment (PPE) to prevent transmission, provision of drugs and medical equipment, especially over the counter drugs for self-medication patients without or with mild symptoms, providing home pharmacy care, offering information related to COVID-19, and urges the public to always obey the health protocols policy [5].

Pharmacists in pharmacies are closely related to drug services with and without prescriptions, especially for COVID-19 patients without or with mild symptoms, so it is very important to review the readiness of pharmacist practices in pharmacies in providing appropriate pharmaceutical services during the COVID-19 pandemic [6]. There is no research that discusses pharmacists in pharmacies especially in the East Java region related to this topic, so that researchers are interested in knowing whether there is an effect of knowledge and experience on the readiness of pharmacists' practices in pharmacies during the COVID-19 pandemic.

2 Material and Methods

2.1 Study Design and Participants

This study used an analytic observational method with a cross-sectional approach. The respondents were pharmacists practicing in pharmacies in East Java, Indonesia which taken using convenient sampling method. Data were collected by distributing questionnaires using googleform platform from November 2021 to December 2021.

2.2 Sample Size

Samples used in this study is calculated by the following formula:

$$n = \frac{Z^2 P(1-P)}{d^2}$$

n = sample size

p = population proportion = 50% = 0,5

d = deviation = 10% = 0,1

Z = confidence level = 95% = 1,96.

Based on the formula above, the minimum number of samples needed is:

$$n = \frac{1,96^2 0,5 . 0,5}{0,1^2} = 96,04 \sim 100$$

Therefore, the minimum number of samples needed in this study was 100 respondents.

2.3 Instrument Development and Validation

Questionnaire used in this study distributed using googleform platform. The questionnaire consists of 4 sections (demographic data, knowledge about COVID-19, experience during the COVID-19 pandemic, and readiness in dealing with the COVID-19 pandemic). Demographic data includes gender, age, education level, years of experience, and area of practice. The knowledge questionnaire consists of 9 questions covering definition, etiology, transmission, diagnosis, signs and symptoms, risk factors, pharmacological therapy, and non-pharmacological therapy. The experience questionnaire consists of 10 questions which adopted from the research by Sotomayor-Castillo et al. (2021). Knowledge and experience questions are closed-ended questions using a Guttman scale with answers "True" or "False" and "Yes" or "No". The readiness questionnaire consists of 15 questions including 4 optimism questions, 5 innovativeness questions, 3 discomfort questions, 3 insecurity questions. The questionnaires (knowledge, experience and readiness) used has been tested for validity and reliability conducted with 40 pharmacists as respondents using the SPSS 25 (license number: 5G6HJ-876H5-GF4D3-23X4F-789PLK).

2.4 Data Analysis

Knowledge and experience data analysis. The data on knowledge and experience questionnaire were processed using the formula:

$$\frac{\text{Number of correct answer}}{\text{Total numer of answer}} \times 100\%$$

"Good" category if the score is 76–100%, "Fair" if the score is 56–75%, and "Poor" if the score is less than 55% [8].

Readiness analysis. The data on the readiness questionnaire was processed using the Technology Readiness Index (TRI) Approach [9].

"Low readiness" category if the TRI value is <2.89, "Medium readiness" if the TRI value is 2.90–3.51, "High readiness" if the TRI value is >3.51. Furthermore, multiple linear regression analysis was performed using the SPSS 25 to determine the effect of knowledge and experience on readiness.

3 Result and Discussion

3.1 Demographic Data

The number of respondents used in this study were 115 respondents. Based on Table 1, a majority of respondents are women (84.3%) with approximately half were aged $>$25–35 years (55.7%). There is no significant correlation that associate gender and age with level of knowledge or experience. Both men and women can have the same level of knowledge and experience related to COVID-19, this is because they are in the same conditions and environment. Which in this case, pharmacists are both facing the COVID-19 pandemic [10, 11].

Table 1. Demographic characteristic

Characteristic	N (%)
Gender	
Male	18 (15.7%)
Female	97 (84.3%)
Age (years)	
20–25	16 (13.9%)
>25–35	64 (55.7%)
>35–45	28 (24.3%)
>45–55	5 (4.3%)
>55	2 (1.8%)
Pharmacist Education level	
Bachelor of pharmacy	94 (81.7%)
Master of pharmacy	20 (17.47%)
Doctor of pharmacy	1 (0.9%)
Years of experience	
<12 months	25 (21.7%)
1–5 years	50 (43.5%)
6–10 years	15 (13.1%)
>10 years	25 (21.7%)

All respondents are graduated pharmacists or practicing pharmacists with bachelor, master, or doctoral degree and most of them were bachelor of pharmacy (81.7%). Most respondents had 1–5 years of experience (43.5%). The research of Mazrouei et al. [12] showed that pharmacists with 5–10 years of practice experience tended to have a better level of knowledge about COVID-19 than pharmacists with less than 2 years of practical experience ($p = 0.03$) [13]. According to Hoti et al. [5], pharmacists with longer practice experience (>5 years) tend to be more prepared in terms of PPE to take measures to prevent the spread of COVID-19 ($p = 0.004$).

3.2 Pharmacist Knowledge About Covid-19

Most of pharmacists didn't quite understand about definition and etiology of COVID-19 (N = 67; 58.3%) as shown in Table 2. This might be because pharmacists only understand the etiology of COVID-19 caused by the SARS-CoV-2 virus and didn't understand the structure of the SARS-CoV-2 virus, which is an RNA virus [14].

Around half of pharmacists didn't understand related contagious of COVID-19 (N = 60; 52.2%). Sars-Cov-2 virus could survive long enough on plastic and steel surfaces (up to 3 days) [15]. Kampf et al. stated that Sars-Cov-2 can survive up to 9 days on the surface of inanimate objects such as glass, metal, or plastic at room temperature [16].

Table 2. Pharmacist knowledge about COVID-19

Statement	True	False
COVID-19 is an infectious disease caused by SARS-CoV-2 which belongs to the DNA viruses	48 (41.7%)	67 (58.3%)
Sars-Cov-2 virus can survive on the surfaces of doorknob for one day	60 (52.2%)	55 (47.8%)
Rapid antigen test is the gold standard for diagnosing COVID-19	69 (60%)	46 (40%)
Clinical signs of severe COVID-19 commonly are fever, cough, shortness of breath, respiratory rate >30 x/minute or SpO_2 <93%	105 (91.3%)	10 (8.7%)
Diabetes mellitus may exacerbate COVID-19 due to increased expression of ACE2	94 (81.7%)	21 (18.3%)
Corticosteroids can be given to severe COVID-19 with cytokine storm	107 (93%)	8 (7%)
Favipiravir is only given to COVID-19 patients when symptoms are severe/critical	65 (56.5%)	50 (43.5%)
The interval first dose to second dose for AstraZeneca vaccine is 28 days	80 (69.6%)	35 (30.4%)
Consumption of pure cow's milk and coconut water can cure COVID-19	105 (91.3%)	10 (8.7%)

Approaching half of pharmacists don't understand related administration of favipiravir for pharmacological treatment of COVID-19 (N = 50; 43.5%). The results of clinical trials showed that favipiravir was effective in terms of viral clearance, improvement of lung imaging in mild to moderate patients, and well tolerated safety [17]. Other studies have shown favipiravir can increase viral eradication within 7 days and clinical improvement within 14 days, especially in mild to moderate COVID-19 patients [18]. Meanwhile, for COVID-19 patients with severe symptoms, favipiravir doesn't cause an adequate clinical response [19].

According to Fig. 1, approaching half of pharmacists have a good level of knowledge (N = 56; 48.7%). This may be due to many seminars and training related to COVID-19 held by the Indonesian Pharmacists Association or other health organizations that pharmacists can participate in so they can increase knowledge related to COVID-19. Pharmacists can increase knowledge about COVID-19 by accessing the latest information related to COVID-19 from the official website of the Indonesian Pharmacist Association, the Ministry of Health of the Republic of Indonesia, published articles, World Health Organization, or other guidelines on COVID-19 published by local professional health organizations or international [5].

3.3 Pharmacist Experience About Covid-19

Most of pharmacists have never experienced being a task force for handling the COVID-19 spike in the workplace or residence (N = 95; 82,6%). This due to the opportunity

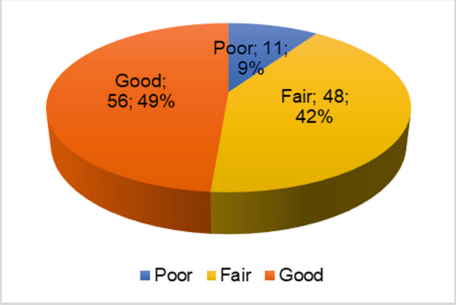

Fig. 1. Pharmacist knowledge percentage

Table 3. Pharmacist experience about COVID-19

Statement	Yes	No
Involve in case screening, such as advising patients for COVID-19 tests	75 (63.5%)	40 (34.8%)
Become a task force for handling the COVID-19 spike in the workplace or residence	20 (17.4%)	95 (82.6%)
Reviewed and update procedures for pharmaceutical services at pharmacies during the COVID-19 pandemic	87 (75.7%)	28 (24.3%)
Manage working hours to minimize exposure	93 (80.9%)	22 (19.1%)
Getting stigmatized and shunned by society for serving COVID-19 patients	13 (11.3%)	102 (88.7%)
Getting psychological support and stress prevention facilities from workplace	56 (48.7%)	59 (51.3%)
Provide appropriate PPE (KN95 masks or double masks), gloves, and goggles/faceshields)	105 (91.3%)	10 (8.7%)
Conduct online consultations with patients	73 (63.5%)	42 (36.5%)
Having difficulty in procuring pharmaceutical during COVID-19	91 (79.1%)	24 (20.9%)
Having decreased income due to COVID-19	55 (47.8%)	60 (52.2%)

for pharmacists who practice in pharmacies to take part in as a COVID-19 task force can only be carried out at residence basis of personal consciousness. This is different from pharmacists who practice in public health centers or hospitals in which there is a task force structure for handling COVID-19, thereby increasing the opportunity for pharmacists there to take part as a COVID-19 task force [20] (Table 3).

Almost all have never been stigmatized and shunned by society for serving COVID-19 patients (N = 95; 82,6%). This may be due to currently many of people have good knowledge regarding COVID-19 if compared to the early era of the pandemic in 2019–2020 where public stigma is still very often accepted by health workers. The results are in line with the research results of Sotomayor-Castillo et al. which shows that a

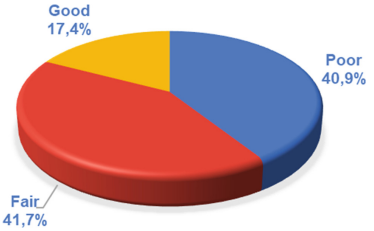

Fig. 2. Pharmacist experience percentage

small proportion of respondents feel shunned by family or friends (29.9%) and a small proportion experienced or finded discrimination because of their work as health workers related to COVID-19 (17.3%) [7].

Approximately half of pharmacists never got psychological support and stress prevention facilities from the workplace (N = 59; 51,3%). Pinggian et al. finding the prevalence of psychological impacts such as stress, anxiety and depression in health workers during the COVID-19 pandemic [21]. Psychological support, especially for those who show signs of trauma and stress, is very important during the pandemic so as to prevent health workers from the negative impact of mental health problems [21].

More than half of pharmacists haven't experienced a decrease income due to COVID-19 (N = 60; 52,2%). With the Government's appeal to the public to maintain health and increase body immunity, sales of multivitamins and medicines during the COVID-19 pandemic have increased by around 50–100% compared to before the pandemic [22]. This increase was influenced by increased sales of drugs and medical devices related to COVID-19 such as masks, hand sanitizers, face shields, medicines and multivitamins [23, 24].

Reffering on Fig. 2, most of pharmacist have fair level of experience (N = 48; 41.7%) and most also have poor level of experience (N = 47; 40.9%). Due to COVID-19, pharmacists are faced with an unprecedented situation and must adapt in order to provide appropriate pharmaceutical services in all eras. Pharmacists' experience in dealing with the COVID-19 pandemic can show pharmacists' ability to adapt and respond to the COVID-19 pandemic.

3.4 Pharmacist Readiness in Dealing with the Covid-19 Pandemic

The readiness questionnaire is a closed-ended question using a Likert scale with the answers "Strongly agree", "Agree", "Disagree", and "Strongly disagree". The Questionnaire consist of 4 indicator, namely optimism, innovativeness, discomfort dan insecurity as shown in Table 4. The results of data analysis using the Technology Readiness Index (TRI) approach are shown in Fig. 3. The value for optimism indicator is 0.95; innovatiness is 0.86; discomfort is 0.79; and insecurity is 0.75; and the total value of TRI is 3.35.

This value falls into the range of 2.90–3.51 so that the readiness of pharmacist practice in the era of the COVID-19 pandemic is in the category of medium readiness. The optimism indicator gave the largest contribution to the total value of TRI. It indicates that pharmacists have a strong belief that the prevention and control of the COVID-19 pandemic can have a better impact on their lives. The innovation indicator provides

Fig. 3. The results of technology readiness index (TRI)

the second largest portion of the total TRI value. However, the innovation indicator is considered to have a large enough difference compared to the optimism indicator so that more efforts are needed from pharmacists to improve the innovative nature of carrying out efforts to control the COVID-19 pandemic. The value of the discomfort and insecurity indicators after reverse coding has a small portion of the total TRI value. This indicates that pharmacists have a low sense of comfort and security in preventing and controlling the COVID-19 pandemic, so pharmacist efforts are needed to increase self-confidence and belief in carrying out efforts to control the COVID-19 pandemic.

3.5 Multiple Linear Regression Analysis

Based on the results of multiple linear regression analysis (Table 4), obtained the equation **Y = 32.371 + 2.706 X1 + 0.242 X2**. It shows that:

1. The constant value is positive 32.371. It shows that if the knowledge and experience variables are 0 or constant, then the value of pharmacist' practice readiness is 32.371. The positive sign indicates a unidirectional effect between the independent variable and the dependent variable.
2. The value of the knowledge variable coefficient (X1) is 2.706. It shows that if the pharmacist' knowledge increases by 1%, the pharmacist' practice readiness will also increase by 2.706%. Assuming that the experience variable remains constant or does not change.
3. The value of the experience variable coefficient (X2) is 0.242. It shows that if the pharmacist' experience increases by 1%, the pharmacist practice readiness will also increase by 0.242%. Assuming that the knowledge variable remains constant or does not change.

3.6 Simultaneous Significance Test (F-Test)

Simultaneous significance test was conducted to determine the effect of knowledge and experience variables simultaneously (together) on the readiness variable. This test used a significance value of 0.05 ($\alpha = 5\%$) and an F-table value of 3.07. Referring on Table 5, the F-count value is 38.114 with a significance of 0.000. This shows that the F-count

Table 4. Readiness in dealing with the COVID-19 Pandemic

Statement	N (%)			
	Strongly agree	Agree	Disagree	Strongly disagree
Optimism				
I feel confident wearing a mask can reduce the transmission of COVID-19	96 (83.5%)	19 (16.5%)	0 (0%)	0 (0%)
I feel confident washing hands with soap or using hand sanitizer can prevent the transmission of COVID-19	94 (81.7%)	19 (16.5%)	2 (1.7%)	0 (0%)
I feel confident that adopting a healthy diet with balanced nutrition can fight COVID-19	94 (81.7%)	20 (17.4%)	1 (0.9%)	0 (0%)
I feel confident that getting vaccinated against COVID-19 will reduce the chances of getting infected with COVID-19	92 (80%)	20 (17.4%)	3 (2.6%)	0 (0%)
Innovatiness				
I always provide PPE such as KN95 masks or double masks (medical and cloth), gloves, and goggles/faceshields for pharmacists and all staff at the pharmacy	84 (73%)	23 (20%)	7 (6.1%)	1 (0.9%)
I provide a special area for patients with ARI symptoms to prevent the spread of COVID-19	49 (42.6%)	40 (34.8%)	20 (15.7%)	6 (4.3%)
I provide electronic payment to reduce the transmission of COVID-19	56 (48.7%)	36 (31.3%)	18 (15.7%)	5 (4.3%)
I provide social distancing signs on waiting chairs and in cashier queues to reduce the transmission of COVID-19	86 (74.8%)	23 (20%)	6 (5.2%)	0 (0%)

(*continued*)

Table 4. (*continued*)

Statement	N (%)			
	Strongly agree	Agree	Disagree	Strongly disagree
I am interested and have attended seminars/trainings about COVID-19	71 (61.7%)	34 (29.6%)	8 (7%)	2 (1.7%)
Discomfort				
I feel more comfortable taking off my mask when doing consultation because easier to communicate with patients	9 (7.8%)	10 (8.7%)	19 (16.5%)	77 (67%)
I feel less/not confident when remind people/patients who don't wear masks	12 (10.4%)	11 (9.6%)	27 (23.5%)	65 (56.5%)
I feel less/uncomfortable when doing online consultations	15 (13%)	25 (21.7%)	38 (33%)	37 (32.2%)
Insecurity				
I feel incompetent in providing education and information about COVID-19	6 (5.2%)	24 (20.9%)	45 (39.1%)	40 (34.8%)
I prefer to use cash payments than electronic payments	13 (11.3%)	37 (32.2%)	39 (33.9%)	26 (22.6%)
I am worried that the pharmacy where I work will be less crowded if it requires all patients who come to wear masks and obey the signs of social distancing	7 (6.1%)	11 (9.6%)	36 (31.3%)	61 (53%)

$>$ F-table and a significance of $0.000 < 0.05$, so it can be interpreted that the knowledge and experience variables simultaneously affect readiness (hypothesis accepted).

3.7 Partial Significance Test (t-Test)

The partial significance test was conducted to determine the partial effect of the independent variable on the dependent variable by assuming the other independent variables to be constant. This test used a significance value of 0.05 ($\alpha = 5\%$) and a t-table value

Table 5. Multiple linear regression analysis result

Variable	Unstandardized coefficients	
	B	Std. error
(Constant)	32.371	2.369
Knowledge	2.706	0.317
Experience	0.242	0.236

Table 6. Multiple linear regression analysis result

Variable	F	Significance value
effect of knowledge and experience variables simultaneously on the readiness	38.114	0.000

Table 7. Partial significance test result

Variable	t	Significance value
Knowledge	8.540	0.000
Experience	1.027	0.306

Table 8. Coefficient of determination test result

Model	R	R Square
1	0,636	0,405

of 1.983. From the results of data processing shown in Table 6, the knowledge variable obtained a t-count of 8,540 with a significance of 0.000. Due to t-count > t-table and a significance of 0.000 < 0.05, it can be interpreted that the knowledge variable has a partial effect on readiness (hypothesis accepted). In the experience variable data processing, the t-count is 1.027 with a significance of 0.306. Due to t-count < t-table and significance 0.306 > 0.05, it can be interpreted that the experience variable has no partial effect on readiness (hypothesis rejected) (Table 7).

3.8 Coefficient of Determination Test Result (R^2)

The coefficient of determination test is carried out to measure the influence of the independent variables have together on the dependent variable. Here are the results of the coefficient of determination (R^2) test data (Table 8).

Based on the coefficient of determination test, the R Square value was 0.405 or 40.5%. This shows that 40.5% of pharmacist practice readiness in the COVID-19 pandemic era

is influenced by knowledge and experience. Meanwhile, 59.5% of pharmacist practice readiness in the COVID-19 pandemic era was influenced by other variables outside of the independent variables of this study.

Results of this study are in line with the research results of Mazrouei et al. [12] which states that knowledge has a significant effect on readiness. In this case, pharmacists with good knowledge tend to have a better level of readiness in preventing and controlling the COVID-19 pandemic. Knowledge is one of the factors that affect readiness. Each individual has a different level of knowledge and intelligence, where a higher level of knowledge will bring individuals faster in solving the same problem when compared to individuals who have a lower level of knowledge. The level of knowledge possessed by individuals plays an important role as one of the criteria for whether the individual has readiness to do a job [25]. In this study, especially pharmacists who have high knowledge related to COVID-19 will logically have better readiness in providing pharmaceutical services in the pandemic era.

Different from the knowledge variable, in this study the experience variable had no effect on readiness. This result different with other study. Research by Mazrouei et al. [12] mentioned that experience has a significant influence on readiness. Research by Hoti et al. [5] also stated that the experience aspect affected the readiness of pharmacists in preventing the spread of COVID-19. However, what needs to be underlined is that the experience measurement parameter used in the two studies is the length of time/period of work of pharmacists and not the parameters for controlling and implementing aspects of pharmacist works to face the COVID-19 pandemic.

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