

## Community Pharmacist's Perception of the Benefits, Patient Needs, Readiness, and Barriers to Implementing Telepharmacy Services

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### ABSTRACT

Telepharmacy has demonstrated a beneficial influence on delivering pharmacy services; however, some limitations still discourage its use by pharmacists. The perceptions of pharmacists toward telepharmacy are required to develop a strategy for establishing telepharmacy. This study aimed to ascertain pharmacists' perceptions and analyze the factors associated with their perception toward telepharmacy services of community pharmacists in Yogyakarta, Indonesia. A cross-sectional study using a validated 29-item questionnaire was conducted in Yogyakarta during March–July 2023. The survey was conveniently distributed to community pharmacists using paper-based forms and Google form links shared via WhatsApp groups and individual contact numbers. Of the 273 pharmacists, 87.5% (N = 239) were female, 44.7% (N = 122) had less than 5 years of experience working in a community pharmacy, and 79.9% (N = 218) had been implementing telepharmacy. All of the pharmacists exhibited a positive perception toward telepharmacy. Testing the demographic characteristics associated with pharmacists' perception revealed that the type of pharmacy showed a significant correlation to benefit, readiness, and barrier to implementing telepharmacy. However, the availability of telepharmacy was significantly associated with the perception of benefits, patient needs, readiness, and barriers to implementing telepharmacy. The positive perception of community pharmacists in Indonesia regarding telepharmacy services revealed the need for it to be optimized with comprehensive regulations, guidelines, and technical infrastructure support.

**Keywords:** community pharmacist, perception, telepharmacy, Indonesia

## INTRODUCTION

The use of information and telecommunication technologies has rapidly expanded during the 20<sup>th</sup> century. These trends have influenced healthcare service models, including the implementation of telemedicine and telepharmacy services. The Centers for Medicare and Medicaid Services (CMS) defined telemedicine as "the use of telecommunications and information technology to provide access to health assessment, diagnosis, intervention, consultation, supervision, and information across distance." This includes technologies such as telephone, electronic mail, and remote patient monitoring devices (CMS, 2024). Meanwhile, telepharmacy reflects the same definition as telemedicine, but it refers to the provision of pharmaceutical services. It was in

1997 that the National Association of Boards of Pharmacy (NABP) officially defined telepharmacy as "The provision of pharmaceutical care through the use of telecommunications and information technologies to patients at a distance" (Angaran, 1999).

As health professionals, pharmacists can provide drug information, self-medication, and drug therapy monitoring, rather than only dispensing medicinal products. Moreover, through telepharmacy, pharmacists can remotely perform medication order reviews, dispensing and compounding, drug information services, patient counseling, therapeutic drug monitoring, and pharmacist prescription verification. In a previous study, telepharmacy was shown to be effective by increasing access to healthcare services in remote

and rural areas and enhancing economic benefits and patient satisfaction. This was the result of improved medication access and information in rural areas, managing medication reviews, effective patient counseling, and reduced scarcity of local pharmacist and pharmacy services (Poudel, Arjun and Nissen, 2016). In addition, this may be a potential solution to the lack of pharmacy personnel problem in underserved areas (Baldoni et al., 2019). From the patients' perspective, telepharmacy is expected to provide online drug purchasing, counseling, drug information services, and side effect reporting via online chat or website, which would be accessible 24 h a day (Rahmatika, 2021).

Despite the positive impact of telepharmacy, there are limitations, including legal implications, lack of information and technology resources, high operational costs, and security data issues that need to be addressed (Ibrahim et al., 2020; Poudel, Arjun; Nissen, 2016; Urick et al., 2023). This study aimed to ascertain pharmacists' perceptions of the benefits, patient needs, readiness, and barriers to implementing telepharmacy services.

Telepharmacy has been popularly used in Indonesia since the COVID-19 pandemic was announced at the beginning of 2020. The government, through the Ministry of Health, released the Ministry of Health Number 14, 2021, regulation regarding telemedicine in which telepharmacy was included. Unlike the other regulations about pharmacy practice in Indonesia, which were followed by a guideline as technical guidance to make it more practical for practitioners, regulations regarding telepharmacy do not have guidelines. Furthermore, another study observed patients' perceptions regarding telepharmacy services during the COVID-19 pandemic in Indonesia and showed that telepharmacy was effective in delivering pharmaceutical services (Fattah et al., 2022).

Pharmacists' perception and readiness to implement telepharmacy in the community and hospital have previously been investigated in Malaysia (Elnaem et al., 2022), Vietnam (Dat et al., 2022), Pakistan (Muhammad et al., 2022), Jordan (Abu Farha et al., 2023), and Saudi Arabia (Ahmed et al., 2023). Most of the study participants responded with positive perceptions and exhibited a high willingness and readiness to implement telepharmacy. There is currently no relevant study in Indonesia regarding this other than a published thesis, which included research performed in Malang with a limited sample size (Ahliyah, 2022).

Although pharmacists' perceptions and readiness to implement telepharmacy have been investigated, the authors found that in these studies the pharmacists' perceptions were investigated in general. Therefore, this study classified pharmacists' perceptions into four domains to specify factors contributing to the pharmacists' perceptions. Moreover, in this study, pharmacists' perceptions regarding patients' need for telepharmacy were included, which have not been investigated in other studies. In addition, as there are no specific regulations and guidelines regarding telepharmacy services in Indonesia, pharmacists' perceptions and readiness toward telepharmacy in Indonesia need to be investigated.

## **MATERIALS AND METHODS**

### **Study Design**

This cross-sectional study was performed from March to July 2023 in Yogyakarta, Indonesia, using Google Forms and a paper-based questionnaire.

### **Study Participants**

All of the registered pharmacists working in the community setting located in Yogyakarta, Indonesia, and willing to voluntarily participate in the study were considered eligible for the survey. The respondents were selected by convenience sampling. The questionnaire was spread to all regions to obtain representatives from each region. There was a considerable difference between the number of pharmacists working in pharmacies in each region. The survey link was sent via community pharmacy WhatsApp groups and individual contact numbers, and direct interviews were performed using a paper-based questionnaire. The required sample size was calculated using Slovin's formula, which—with a population size of approximately 700 registered pharmacists in Yogyakarta—revealed the need for 255 respondents. Therefore, the total of 273 respondents met the minimum sample size requirement with a 5% margin of error and a 95% confidence level.

### **Study Instrument**

The 29-item questionnaire was used as the study instrument and developed by reviewing literature and receiving advice from pharmacy professional experts and academics. This was previously used by Sulistyawati (2023). Considering the content and validity, a pilot study was conducted with 30 pharmacists. The reliability

coefficient was checked using SPSS version 24, and the Cronbach alpha value was 0.87, thus indicating its reliability. The questionnaire consisted of five sections: demographics, pharmacist's perception regarding benefits, patient needs, readiness, and barriers to implementing telepharmacy. The demographic section included gender, age, level of education, pharmacy location, length of working experience, pharmacy type, and the availability of telepharmacy services at the pharmacy, as well as the telepharmacy model used. The pharmacy type is defined as how the pharmacy was managed or owned. It is divided into two categories: chain pharmacies and independent pharmacies. Chain pharmacies refer to pharmacies that were under management, and the same system was implemented at several outlets. Independent pharmacies refer to single-outlet pharmacies. The second section, which was concerned with the benefit of the telepharmacy service for the patient, contained seven questions. The third section on patients' need for telepharmacy consisted of five questions. The fourth section of readiness to implement telepharmacy consisted of 10 questions. The final (fifth) section of the challenge of telepharmacy consisted of seven questions. All responses were recorded on a four-point "Likert scale" as follows: strongly disagree = 1, disagree = 2, agree = 3, and strongly agree = 4.

#### Data Collection and Statistical Analysis

The survey was conveniently distributed to the community pharmacists using a paper-based questionnaire and a Google form link shared via WhatsApp groups and individual contact numbers. The Indonesian Pharmacist Association of Yogyakarta (PD IAI DIY) supported the authors in gaining data from their members. The responses were collected in a Microsoft Excel sheet and coded for statistical analysis in SPSS version 24.0. Data for the categorical variables were presented as number (N) and percentage (%), while the continuous variables were presented as mean (M) and standard deviation. Furthermore, the Mann-Whitney U test was performed to determine the effect of several independent variables on the main dependent variable.

#### Ethical Consideration

Only participants who voluntarily consented to participate in this study were recruited. The informed consent to participate in the study was obtained via the Google form and paper-based

questionnaire, which included a description of the nature and purpose of the study and the questionnaire. All collected data were strictly confidential and would only be used for the study. The study received official ethical review and approval from the Medical and Health Research Ethics Committee, Faculty of Medicine, Public Health, and Nursing, Universitas Gadjah Mada-DR. Sardjito General Hospital, reference number: KE-FK-0416-EC-2023.

## RESULTS AND DISCUSSION

### Demographic Characteristics

A total of 273 pharmacists who participated in the study (N = 239, 87.5%) were female. Most of them had less than 5 years of experience working in a community pharmacy (N = 122, 44.7%) and had been implementing telepharmacy (N = 218, 79.9%). Furthermore, most of the respondents worked in independent pharmacies (N = 158, 57.8%), and the remaining respondents were from chain pharmacies (N = 112, 42.1%) (Table I).

Various communication models and platforms were used by pharmacists to deliver telepharmacy services, and Figure 1 summarizes the frequency of each model and platform. Most of the respondents used more than one communication model and platform to deliver telepharmacy. Phone calls, chat consultations, and video conferences were the communication models used for telepharmacy (Figure 1). Chat consultation using secure messaging platforms, such as WhatsApp and Line, was the most frequently used platform by pharmacists (N = 150, 54.9%). This was followed by phone calls (N = 131, 47.9%) and chat consultations using telemedicine applications (N = 105, 38.5%), and a small number of pharmacists reported using videos for delivering telepharmacy (N = 9, 0.03%). This finding is similar to that of other studies conducted in Vietnam and Canada. Phone calls were the most frequent communication model used in Vietnam (83.6%) and Canada (61.9%), followed by secure messaging and videos. Secure messaging using Zalo (72.7%) became a secondary model that was widely used in Vietnam, whereas in Canada, people tended to use video conferencing (e.g., Zoom and Skype) (31.0%) for delivering telepharmacy services. Other platforms that are also used in Canada are ScriptPro, FaceTime, WhatsApp, Ask Your Pharmacist, and Webex (Dat et al., 2022; Park et al., 2022).

Table I. Demographic Characteristics of respondents (N=273)

Variables	Frequency (N)	Percentage (%)
<b>Gender</b>		
Male	34	12.5
Female	239	87.5
<b>Age</b>		
≤30 years old	154	56.4
>30 years old	119	43.6
<b>Level of education</b>		
Bachelor and profession	247	90.5
Magister	26	9.5
<b>District of practice</b>		
Sleman	81	29.7
Yogyakarta	122	44.7
Bantul	40	14.6
Kulonprogo	17	6.2
Gunung Kidul	13	4.8
<b>Length of practice experience</b>		
<5 years	122	44.7
5-10 years	82	30.0
>10 years	69	25.3
<b>Type of pharmacy</b>		
Chain Pharmacy	115	42.1
Independent Pharmacy	158	57.9
<b>Availability of telepharmacy service</b>		
Yes	218	79.9
No	55	20.1

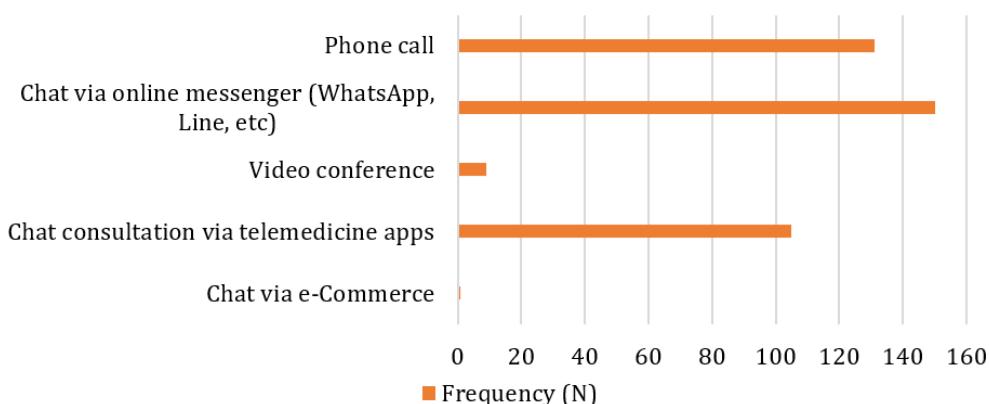


Figure 1. The communication models and platforms used by community pharmacists in Yogyakarta Province to deliver telepharmacy services

Despite the various communication models and platforms used, the effectiveness of communication itself is of great importance. Two systematic reviews found that telehealth services using video and phone calls had similar outcomes in terms of patient satisfaction, service outcomes, and cost outcomes. However, in terms of clinical outcome, videos appeared to be more effective than

phone calls when visual observation of the patient's clinical condition was required, especially when verbal communication was limited, such as for pediatric or extremely sick patients (Byambasuren et al., 2023; Caffery et al., 2024). In addition to the increased use of telemedicine applications, telepharmacy as a feature in telehealth applications was popularly used (N = 105, 38.5%).

The COVID-19 pandemic elevated the growth of telemedicine applications, and since then Indonesia has locally developed digital health applications, such as AloDokter, HaloDoc, and GO-MED (Hakim, Elsie F.; Pardede, 2022). These applications are registered as Pharma Electronic System Operators (PESOs) based on Ministry of Health Regulation No. 26 of 2018 on Electronic Integrated Business and adhere to the regulations of Ministry of Health No. 73 of 2016 concerning the Standards of Pharmaceutical Services in Pharmacy. Therefore, they can provide pharmaceutical services, including the distribution of over-the-counter (OTC) medication and prescription-only medicine. Moreover, there was one respondent who was known to use a marketplace, namely Tokopedia, to place orders for OTC products. This is controversial because this marketplace is not PESO registered and cannot follow the standard of pharmaceutical services, but it is popularly used for ordering OTC.

To date, the government has yet to prepare an extensive regulatory framework to specifically guide digital health businesses. It is currently limited to telemedicine, which is used at health service facilities (e.g., hospitals and clinics), under the Ministry of Health Regulation No. 20 of 2019 on Telemedicine Services as part of Health Services Facilities (Regulation 20/2019); and online distribution of medicine, under the National Agency of Drug and Food Control Regulation No. 8 of 2020 on the Supervision of Online Distribution of Medicine and Food (Regulation 8/2020) (Hakim, Elsie F.; Pardede, 2022). However, the following rules that govern telepharmacy and digital health offerings, in general, might be relevant (Indonesia. Ministry of Health, 2021). Telepharmacy as a part of telemedicine must obtain the Regulation of the Indonesian Ministry of Health No. HK.01.07/MENKES/4829/2021 concerning The Guidelines of Healthcare Services through Telemedicine Amid the Pandemic of Corona Virus Disease; telepharmacy must follow the Regulation of Ministry of Health No. 73 of 2016 concerning the Standards of Pharmaceutical Services in Pharmacy; drug distribution using a digital platform must obtain the Regulation of Indonesian Agency for Drug and Food Control (BPOM) No. 8 of 2020 concerning the Control of Online Drug and Food Distribution; and the platform provider must obtain Pharma Electronic System Operator Registration from the Ministry of Health as required under Regulation of Ministry of Health

No. 26 of 2018 on Electronic Integrated Business. Based on these general regulations, the marketplace used by the participant is still legally questionable for telepharmacy activities because they are not PESO registered.

The data were dichotomized using the median of the Likert score (2.5) in two categories (Table II). The responses in the domains were categorized into positive and negative to simplify the data presentation and to better interpret participants' responses in each of the four domains. The participants reported positive perceptions in all domains with a large gap between the frequency of positive and negative in the first three domains, i.e., perception regarding benefits, patients' need for telepharmacy, and readiness to implement telepharmacy. However, there was a smaller gap between positive and negative responses regarding the barriers to implementing telepharmacy; although more pharmacists responded positively (N = 157, 57.51%). At this point, participants were questioned about issues that were suspected barriers to implementing telepharmacy, such as uncomprehensive regulation, lack of incentives, problems in operational technology, lack of financial support, patient data issues, and workload. The positive response to the barriers to implementing telepharmacy refers to agreement with those statements.

There was no significant correlation between gender, age, and length of practice with the pharmacists' perception of telepharmacy (Table III). The authors did not find any research that agreed with these findings. Studies performed in Jordan stated that gender, age, education level, and information sources are factors that can influence pharmacists' attitudes toward telepharmacy (Muflah et al., 2021). In Pakistan, the results of the study by Muhammad (2022) revealed that gender and age were significantly associated with pharmacists' perception regarding the implementation of telepharmacy, and Ahmed et al. (2023) found that gender, age, and level of education influenced the pharmacist's perception and readiness to implement telepharmacy in Saudi Arabia. The pharmacists' length of practice did not affect their perception because the intention to use telemedicine or other e-health features was more influenced by other factors not explored in this study, such as platform performance or effort expectancy, social influence, e-health literacy, and trust in virtual healthcare services (Alviani et al., 2023).

Table II. Pharmacists' summary about perception of telepharmacy services

Domain of pharmacists' perceptions	Category	Frequency (N)	Percentage (%)
Benefits of telepharmacy services	Positive	262	95,97
	Negative	11	4,03
Patients' need to telepharmacy services	Positive	268	98,17
	Negative	5	1,83
Readiness to implement telepharmacy	Positive	254	93,04
	Negative	19	6,96
Barriers to implementing telepharmacy	Positive	157	57,51
	Negative	116	42,49

Table III. The correlation between demographic characteristics and pharmacists' perceptions regarding telepharmacy

Variables	Frequency (N=273)	Pharmacist's perception on telepharmacy			
		Benefits	Patient's needs	Readiness to implement	Barriers to implement
		p-value	p-value	p-value	p-value
<b>Gender</b>					
Male	34	0.661	0.957	0.684	0.540
Female	239				
<b>Age</b>					
>30 years old	119	0.993	0.802	0.449	0.908
≤30 years old	154				
<b>Length of practice in pharmacy</b>					
<5 years	122	0.871	0.828	0.389	0.717
≥ 5 years	151				
<b>Type of pharmacy</b>					
Chain/Group pharmacies	115	0.032*	0.057	0.000*	0.089
Independent pharmacies	158				
<b>Availability of telepharmacy services</b>					
Yes	218	0.000*	0.001*	0.000*	0.009*
No	55				

\*Significance correlation (Mann Whitney U-test)

However, the type of pharmacy and availability of telepharmacy services were associated with almost all of the perception domains. The type of pharmacy was shown to be significantly correlated with perceptions regarding patient benefit ( $p = 0.032$ ) and readiness to implement telepharmacy ( $p=0.000$ ). telepharmacy ( $p = 0.000$ ). This finding is relevant as chain pharmacies are known to have greater resource availability to implement telepharmacy compared to independent pharmacies due to their higher number of licensed pharmacists, bigger budget, and well-developed technologies to overcome the initial challenges associated with telepharmacy implementation (Jirjees et al., 2022). In contrast, the type of pharmacy was not significantly correlated with the perception regarding patients'

need for telepharmacy and barriers to implementing telepharmacy ( $p > 0.050$ ). Other studies found opposite results, which reveal that there was a significant pharmacist perception regarding patients' needs and barriers to implementing telepharmacy that is primarily influenced by factors such as patient interaction, regulatory concerns, and the overall quality of care. Regarding patient interaction, chain pharmacists report restricted interaction with patients; on the other hand, independent pharmacists value the potential for telepharmacy for those who have difficulty accessing services. Both groups expressed concern about regulatory issues surrounding telepharmacy; however, independent pharmacists may feel more empowered to navigate these challenges because of their closer ties to the

community and patient needs. The perceived quality of care delivered via telepharmacy was viewed differently, with independent pharmacists potentially seeing it as a complement to their personalized service, whereas chain pharmacists may view it as a substitute that lacks the personal touch (Abu-Farha et al., 2022; Dores et al., 2023; Muhammad et al., 2022; Ng & Sze, 2022; Pavithra et al., 2024).

Several aspects must be established to implement telepharmacy services, including people, policies and procedures, physical space, technology, capacity, and quality of services. These factors were considerably more developed in the management of chain pharmacy (CSHP, 2018).

Indonesia has several chain pharmacies, of which the five top major chains are Kimia Farma (government), Apotek K-24, AS Watsons Group, Guardian Pharmacy, and Century Apotek (Ken Research, 2022). One of these will have almost 600 outlets by the end of 2022 spread nationwide in Indonesia and already provides telepharmacy through the company's official website, as well as via other platforms. With the same potential to play a role in conducting telepharmacy, independent pharmacies require support, especially to build strong technological systems.

The availability of telepharmacy was significantly associated with the four telepharmacy perception domains: benefit ( $p = 0.000$ ), patient needs ( $0.001$ ), readiness ( $p = 0.000$ ), and barriers to implementing telepharmacy ( $p = 0.009$ ) (Table III). This finding was in agreement with that of Abu Farha et al. (2023) who found that pharmacists who were experienced in using telepharmacy showed a more positive perception toward telepharmacy in Jordan.

There are some limitations to this study. As there were two types of chain pharmacies, government and non-government, the authors did not collect data from government chain pharmacists because of permission issues. Thus, the representativeness of the samples to all pharmacies may be a concern. Moreover, the online mode of data collection may lead to selection bias.

## CONCLUSION

The findings of this study reveal that 79.9% of participating pharmacists had implemented telepharmacy, and more than 93% had responded with a positive perception toward telepharmacy regarding benefits, patients' needs, and readiness to implement telepharmacy, whereas 57.51% of them indicated that barriers to implementing

telepharmacy remain, as shown by their positive responses. The correlation test between demographic characteristics and perceptions showed that the type of pharmacy and availability of telepharmacy in the pharmacies were significantly associated with the pharmacists' perception of telepharmacy. Pharmacists at chain pharmacies showed more positive perceptions regarding telepharmacy than those at independent pharmacies. Furthermore, pharmacists who were experienced in implementing telepharmacy exhibited more positive perceptions regarding telepharmacy than pharmacists who were not. In contrast to these positive findings, there are no guidelines on how to conduct good telepharmacy practice. Therefore, the government needs to draft a guideline on how to implement good telepharmacy practices as well as the regulated and standardized standard of pharmaceutical services. Collaboration between the government and the pharmacists' association is required to implement guidelines in community pharmacies so they can be continuously monitored and evaluated.

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## CONFLICT OF INTEREST

The authors declare no conflict of interest in this research.

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