

## A Survey on Community Pharmacists' Interest in Providing Online Pharmacy Services

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### ABSTRAK

Terdapat maklumat yang terhad mengenai penggunaan e-dagang di kalangan ahli farmasi runcit dalam negara membangun. E-farmasi ditakrifkan sebagai farmasi komuniti yang menyediakan perkhidmatan sama ada secara tunggal atau gabungan perkhidmatan farmasi dalam talian seperti pendispensan ubat terkawal secara maya, perundingan produk perubatan dalam talian, perkhidmatan kesihatan dalam talian yang berkaitan dengan ubat-ubatan, perundingan dalam talian yang berkaitan dengan suplemen kesihatan dan produk kecantikan serta perkhidmatan penghantaran produk. Kajian ini bertujuan untuk menerokai minat di kalangan ahli farmasi berlesen runcit dalam menerima e-dagang sebagai sebahagian daripada peruntukan perniagaan mereka dan menentukan faktor penentu minat untuk menyediakan perkhidmatan e-farmasi. Tinjauan dalam talian secara sendiri telah diedarkan kepada 3858 ahli farmasi komuniti berlesen menggunakan senarai emel yang disediakan oleh Bahagian Penguatkuasaan Farmasi, Kementerian Kesihatan. Kadar respon adalah 9.15% (N=353). Dapatan kajian menunjukkan 78.2% daripada responden berminat untuk menyediakan perkhidmatan e-farmasi. Penentu utama kecenderungan ini dipengaruhi oleh persepsi ahli farmasi komuniti terhadap norma pengguna dalam melanggan perkhidmatan dalam talian, trend sosio-teknologi, tekanan daripada persaingan dan kesediaan untuk mematuhi keperluan peraturan e-farmasi. Kajian ini menggesa pihak berkuasa farmasi untuk merumuskan keperluan mesra perniagaan dalam memperkasa ahli farmasi komuniti untuk menerima pakai perkhidmatan e-farmasi dan mewujudkan persekitaran kondusif kepada ahli farmasi komuniti untuk menginovasi amalan farmasi. E-farmasi memberi manfaat kepada orang ramai dengan menyediakan akses kepada produk perubatan yang

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*berkualiti dengan harga yang kompetitif.*

*Kata kunci: farmasi, komunikasi kesihatan, penggunaan internet, perkhidmatan farmaseutikal, preskripsi elektronik, teleperubatan*

## ABSTRACT

There is scarce information on the adoption of e-commerce among retail pharmacists in developing countries. E-pharmacy is defined as community pharmacies provide either singular or a combination of online pharmacy services e.g., virtual dispensing of controlled medicines, online medicinal product consultation, medication-health related online services, health supplements and beauty product online consultation and product delivery services. This study aimed to explore the interest among licensed retail pharmacists to adopt e-commerce as part of their business provisions and to determine key determinants of their interest in providing e-pharmacy services. A self-administered online survey was distributed to 3858 licensed community pharmacists using an email list which was provided by the Pharmacy Enforcement Division, Ministry of Health. The response rate was 9.15% (N=353). Findings showed that 78.2% of the respondents were interested in providing e-pharmacy services. The key determinants of their interest were influenced by community pharmacists' perceptions towards consumer norms in subscribing to online services, socio-technology trends, pressure from competition and readiness to comply with e-pharmacy regulatory requirements. This study urges the pharmacy authority to formulate business-friendly requirements in empowering community pharmacists to adopt e-pharmacy services and establish a conducive environment for community pharmacists to innovate pharmacy practices. E-pharmacy will benefit the public by providing access to quality medicinal products at competitive prices.

Keywords: electronic prescribing, health communication, internet use, pharmaceutical services, pharmacies, telemedicine

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## INTRODUCTION

Community pharmacies can utilise the internet and adopt e-commerce applications to reach out online consumers. Community pharmacies provide online services such as virtual dispensing of controlled medicines, medication adherence

programs including consultation for long term monitoring of medication, addiction management programs, diet management programs and medicine delivery services (Orizio et al. 2011). Online pharmacy services benefit patients who have limited access to a physical pharmacy premises. The online dispensing of prescription and

over-the-counter medicines provide more options for patients to choose products at competitive retail prices (Crawford 2003). As such, online pharmacies or e-pharmacy services can reduce medication cost.

There has been much debate on the ethics and regulations void in allowing community pharmacies to provide online services (Kuzma 2011). E-commerce services are unlike e-pharmacy services as the latter deal with health related services to patients. There are rules that control the sales of prescription and over-the-counter medicines. In order for the pharmacist to dispense a prescription, patient must provide the prescription from a prescriber, and then obtain validation from pharmacist by counter checking the prescription. Pharmacist must dispense controlled medicines according to their professional ethics and ensure patients' health and safety. Likewise, the e-pharmacy services must conform with conservative pharmacy practices to ensure patients' health safety and health data security. Additionally, the Malaysian pharmacy authority prohibits online sales of controlled medicines without proper features imitating the conservative pharmacy practice (Ahmad 2020). At present, the pharmacy authority allows community pharmacists to provide medicinal product delivery services and permits only authorised e-prescription system, with strict requirements. Vague policies have hindered community pharmacies in providing e-pharmacy services due to challenges to comply with the regulatory conditions. However, the

big pharmacy firms have the advantage for market dominance as they have the resources and capacity to invest in the e-pharmacy segment while complying with regulatory requirements (Lim 2020).

The Malaysian e-pharmacy policies aimed to prevent patients from self-diagnosis and self-treatment by their own research through the internet and without engagement with trained medical practitioners or pharmacists (Mohamed Noor & Ibrahim 2016). As such, the e-pharmacy policies prohibit the online advertisement of prescription and over-the-counter medicines. Even though over-the-counter medicines do not require a prescription and can be dispensed by a licensed pharmacist, the over-the-counter class medicines cannot be marketed and promoted in e-commerce platforms. Consequently, the e-pharmacy services are limited only to online sales of non-medicinal products which reduce their reach as common retailers.

In the country which is moving towards a sustainable digital economy, the e-pharmacy services must be considered as one of the pivotal pillars among e-health services in the public community. As more consumers connect online, the e-health market cannot be overlooked. Despite the restrictive e-pharmacy policies, the growing of online shopping trend inevitably pressures the community pharmacies to venture into the e-pharmacy segment. Therefore, this study aimed to explore the readiness of community pharmacies to provide e-pharmacy services as part of their business operations and to determine

the key factors that influence their interest in adopting e-commerce into their pharmacy practice. The findings of the study can contribute to informed policy makers in empowering community pharmacies to adopt e-pharmacy services.

## MATERIALS AND METHODS

This study defined e-pharmacy or online pharmacy services as community pharmacies that provided online sales of controlled medicines by virtual dispensation and e-prescription applications, medication related online consultation programs such as long-term medication review and monitoring, pharmacy related services such as smoking addiction cessation management, obesity diet management, health and beauty product consultation and medicine delivery services. Respondents included in the study were licensed pharmacists who were managing retail pharmacy at community settings.

### Questionnaire Development

The questionnaire was developed based on three cohort demographic data collection and ten determinants that might influence interest in providing e-pharmacy services. The demographic data was designated to explore the types of pharmacies, knowledge and experience of using e-commerce platforms and perception of e-pharmacy policies. The ten dimensions of determinants that might influence community pharmacists' interest in providing online pharmacy

services were; (i) consumerism norms; (ii) business competition; (iii) socio-technology trends; (iv) perceived beneficial investments; (v) e-commerce usefulness; (vi) resources readiness; (vii) perceived friendly government policies; (viii) perceived pharmacy professional obligation towards patient's needs; (ix) regulatory requirement compliance readiness; and (x) medicine delivery services readiness.

### Questionnaire Design

The questionnaire was designed using Google Forms. There were five sections, i.e. (i) respondent's general demographic data; (ii) respondent's knowledge and experience in using e-commerce; (iii) respondent's perception of e-pharmacy regulatory requirements; (iv) determinants that might influence interest in providing online pharmacy services; and (v) behavioral interest in providing online pharmacy services. The survey used 5-Likert scale to indicate respondent's response to the survey questions. All questions were designed with positive question statements.

### Validity and Reliability of the Questionnaire

The newly developed questionnaire was face validated by three experts, i.e. an academican from Universiti Sains Malaysia (USM), a research officer from the Institute for Health Behavioral Research, Ministry of Health and a biostatistician who had experience in social pharmacy research working at the Pharmaceutical Services

Programme, Ministry of Health. After validation approval by the experts, the pilot test was conducted with 20 respondents to ensure content reliability. The Cronbach alpha determined the eleven items of key behavioral factors that might influence interest in providing e-pharmacy services with the value of 0.826 which indicated the questionnaire contents were reliable for mass distribution.

### **Population Sampling**

The population size of pharmacists in Malaysia as of November 2020 was 3858 with having a Type A retail pharmacy license to manage and sell medicinal substances, prescription and over-the-counter medicinal products. The study employed a finite sampling online calculator which determined the minimal sampling requirement was 350 pharmacists at 95% confidence level and 5% margin error. Sample size online calculator for finite sampling was referred at [www.calculator.net](http://www.calculator.net).

### **Survey Distribution**

The questionnaire was distributed to the population sample by email. The email list was given by the Pharmacy Enforcement Division, Ministry of Health for the purpose of this study. The questionnaire distribution period was from February to March 2021.

### **Data Collection and Data Management**

Data management conformed with the Good Clinical Practice (GCP) that

was introduced by the Ministry of Health Malaysia. The responses were automatically saved into the Google Cloud system. The investigator deleted the data after it was downloaded and saved the file into a Microsoft Excel spreadsheet. The investigator shared the data with peers for statistical analysis purposes. All data pertaining to this study was deleted after completion of the study to ensure of data safety and integrity.

### **Data Analysis**

Descriptive and inferential statistical analysis were performed using IBM SPSS version 26 (IBM Corp, Armonk, NY). This study inferred participant's interest towards e-pharmacy by analysing correlation and association at the confidence level 95%, statistically significance if  $p < 0.05$ .

### **Research Ethical Approval**

This study was registered under the National Medical Research Register (NMRR ID: NMRR-19-4061-50590 (IIR)) and obtained ethical approval from the Medical Research and Ethics Committee (MREC), Ministry of Health Malaysia and the Human Ethics Research Committee of USM (JEPeM USM).

## **RESULTS**

There were 353 licensed community pharmacists which responded to the online survey. Cronbach alpha value of 0.795 determined eleven items as the determinants of interest in providing

online services.

### Respondents' Demographic Data

Respondents' demographic data was presented in Table 1. The highest response of the survey was from the age group of below 30 years old (n=131, 37%). The majority of respondents were female (n=200, 56.7%). Most of the respondents had less than five years of experience in managing community pharmacies (n=144, 40.8%). The majority of the community pharmacies were located at a town or commercial area (n=183, 51.8%). Most of the community pharmacies were independent and small to medium scale retail businesses (n=190, 53.8%).

Community pharmacies provided medication consultation (n=329, 93.2%), long term medication management (n=175, 49.6%), basic health screening (n=308, 87.3%), home medication review (n=85, 24.1%), obesity diet management program (n=122, 34.6%), smoking cessation program (n=119, 33.7%), cosmetic and skin care consultation (n=112, 31.7%) and traditional and complementary medicinal consultation (n=149, 42.2%). Most of the community pharmacies provided a combination of pharmacy services (n=315, 89.2%). Only 11 of the respondents (3.1%) were yet to provide any pharmacy services.

### Respondents' Knowledge and Experience in Online Advertisement and E-commerce Placement

The respondents' knowledge and experience using e-commerce was

presented in Table 1. This study found that the respondents had knowledge and experience in placing their advertisements on online platforms whereby 113 (32.0%) respondents had placed online advertisements at a single online advertising platform and 166 (47.0%) respondents used multiple online advertising platforms to promote their pharmacy services. Only 74 (21.0%) respondents had no experience in promoting their business via the internet. Respondents had experience in utilising e-commerce platforms for their business. Most of the respondents used a single e-commerce platform to sell non-medicinal pharmaceutical products (excluding controlled medicines) (n=153, 43.7%), and 82 (23.3%) respondents used more than one e-commerce platform to sell non-medicinal pharmaceutical products.

### Respondent's Perception on E-pharmacy Regulatory Requirements to Business Compatibility

The respondents' perception on e-pharmacy regulatory requirements to business compatibility were presented in Table 1. This study found that the majority of the respondents perceived e-pharmacy regulatory requirements as being incompatible (n=117, 33.1) and less compatible (n=128, 36.3%) with pharmacy health related business. Nevertheless there was only 15 (4.2%) respondents perceived e-pharmacy regulatory requirements to be compatible with pharmacy health related business provisions, while 93

Table 1: Respondents' demographic data (n=353)

Variables	Total n (%)
Age	
Under 30 years old	131 (37.1)
31 – 40 years old	21 (34.3)
41 – 50 years old	65 (18.4)
51 – 60 years old	28 (7.9)
61 years old and above	8 (2.3)
Gender	
Male	153 (43.3)
Female	200 (56.7)
Experience	
Less than 5 years old	144 (40.8)
6 – 10 years old	75 (21.2)
11 – 15 years old	41 (11.6)
16 years old and above	93 (26.3)
Pharmacy location	
Town area	183 (51.8)
Housing area	170 (48.2)
Type of pharmacy service	
Independent retail pharmacy	190 (53.8)
Consortium of independent pharmacy	81 (22.9)
Corporate pharmacy	82 (23.2)
Available community pharmacy care	
Medication consultation	329 (93.2)
Long term medication management	175 (49.6)
Basic health screening test	308 (87.3)
Home medication review	85 (24.1)
Obesity diet management program	122 (34.6)
Smoking cessation program	119 (33.7)
Skin care consultation	112 (31.7)
Traditional Medicines consultation	149 (42.2)
Services unavailable	11 (3.1)
Provide single pharmacy care service	27 (7.6)
Provide a combination of pharmacy care services	315 (89.2)
Retail pharmacy online marketing placement	
Subscribe to a single online advertising platform	113 (32.0)
Subscribe to multiple online advertising platforms	166 (47.0)
No online advertisement	74 (21.0)
Retail pharmacy at e-commerce placement	
Positioning at a single e-commerce platform	153 (43.7)
Positioning at multiple e-commerce platforms	82 (23.3)
Never used an e-commerce platform	115 (32.9)
Perception of regulatory requirement towards business compatibility	
Incompatible	117 (33.1)
Less compatible	128 (36.3)
Uncertain	93 (26.3)
Compatible	10 (2.8)
Highly Compatible	5 (1.4)

(26.3%) respondents were uncertain about the regulatory compatibility with pharmacy health related business provisions.

### Behavioral Factors that Influenced Interest in Providing Online Pharmacy Services

The respondents' behavioral factors that influenced their interest in providing online pharmacy services were presented in Table 2. This study relied on ten behavioral factors to determine their interest in providing online pharmacy services i.e., perceived beneficial investments (IV1), perceived usefulness (IV2), consumerism norms (IV3), socio-technology trends (IV4), business competition (IV5), resource availability

(IV6), professional obligations (IV7), required compliance readiness (IV8), virtual practice savviness (IV9) and supportive policies from government (IV10).

The mean scores of participants' responses to each item were presented in Table 2. From the responses, the mean scores of all items were above 3.00 and the standard deviation varied between 0.94 and 1.23. The highest mean scores among the items were socio-technology trends (IV4) and business competition (IV5) with both items had same mean score of 4.14 (SD 0.94). Conversely, the least mean score was professional obligations (IV7) with a mean score of 3.16 (SD 1.23).

Agreement in percentage was calculated to demonstrate the influence degree towards pharmacists'

Table 2: Agreement percentages, means and sd values for behavioral determinants that influenced community pharmacist' interest to in providing online pharmacy services (n=353)

Items	Mean (SD)	Agreement* %
IV1: E-pharmacy ability for beneficial investments	3.88 (1.00)	66.6
IV2: E-pharmacy provides useful business provisions to customer	3.86 (0.96)	66.3
IV3: Perceived consumers readiness to subscribe to e-pharmacy services	3.80 (0.98)	63.5
IV4: E-pharmacy reliance to socio-technology trends	4.14 (0.94)	78.2
IV5: Business competition pressure influence to e-pharmacy ventures	4.14 (0.94)	79.9
IV6: Availability of resources to invest in e-pharmacy services	3.66 (1.03)	56.9
IV7: Professional obligations required to provide online pharmacy services	3.16 (1.23)	39.1
IV8: Readiness to comply with e-pharmacy regulatory requirements	3.63 (0.94)	55.8
IV9: Ample knowledge to provide virtual health services	3.85 (0.95)	67.7
IV10: Supportive policies from government enabling community pharmacists to provide e-pharmacy services	3.55 (1.11)	54.7
DV1: Interest in providing e-pharmacy pharmacy services	4.11 (0.95)	78.2

\*subscale score of 4.0 and above; IV: independent variable

interest in providing online pharmacy services. The findings showed that all behavioral items were above 50% agreement except for professional obligations (IV7) with only 39.1% agreement. Respondents' agreement of interest were high in business competition (IV5) with 79.9% of agreement, and socio-technology trend (IV4) with 78.2% of agreement. Following to that, agreement of interest towards providing e-pharmacy services was observed for items IV9 (67.7%), IV1 (66.6%), IV2 (66.3%) and IV3 (63.5%). This study found that 78.2% of the respondents were interested in providing e-pharmacy services.

### **Comparison of Mean Scores across Overall Behavioral Interest in Providing Online Pharmacy Services based on Demographic Data**

The mean scores across overall behavioral interest in providing online pharmacy services based on demographic data were presented in Table 3. There was a significant difference between total mean of behavioral determinant scores and distinct groups of demographics. The perception on regulatory compatibility with business requirements had no statistical significance ( $p=0.058$ ). Otherwise, the findings showed that demographic characteristics i.e., age group, gender, working experience in managing community pharmacies, pharmacy locality, type of pharmacy, available pharmacy healthcare services, pharmacists' knowledge and experience in e-market placement,

and pharmacists' knowledge and experience in online advertisement placement, had a significant effect on their interests to adopt e-commerce as pharmacy services ( $p<0.05$ ).

### **Comparison of Behavioral Interest in Providing Online Pharmacy Services based on Pharmacy Healthcare Services**

Table 4 summarised how community pharmacy healthcare services contributed to their interest in providing online pharmacy services. Community pharmacy healthcare services were categorised into (i) community pharmacies providing single pharmacy healthcare service; (ii) community pharmacies providing combination pharmacy healthcare services; and (iii) community pharmacies yet to provide any pharmacy healthcare service. Findings from Table 4 showed that pharmacy providing combination healthcare services was the highest contributor (91.3%) to the interest in providing online pharmacy services. Both single pharmacy and combination pharmacy healthcare services had a mean score of 3.96 (SD=1.06) and 4.18 (SD=0.86), respectively, which were above the neutral agreement (mean  $>3.00$ ).

### **Comparison of Behavioral Interest in Providing Online Pharmacy Services based on the Knowledge and Experience in E-commerce Market Placement**

Table 5 summarised how the respondents' knowledge and

Table 3: Comparison of mean scores across overall behavioral interest in providing online pharmacy services based on demographic data

Variables	Number n (%)	Overall mean of IV Mean (SD)	F-statistics/ t-statistics*	P value (p<0.05)
Age (years)			2.68	0.031
Under 30	131(37.1)	3.83 (0.59)		
31 – 40	21 (34.3)	3.75 (0.56)		
41– 50	65 (18.4)	3.60 (0.67)		
51 – 60	28 (7.9)	3.64 (0.60)		
61 and above	8 (2.3)	3.36 (0.44)		
Gender			-2.79*	0.006
Male	153 (43.3)	3.63 (0.65)		
Female	200 (56.7)	3.81 (0.55)		
Working Experience (years)			5.41	0.001
Less than 5	144 (40.8)	3.87 (0.57)		
6 – 10	75 (21.2)	3.57 (0.58)		
11 – 15	41 (11.6)	3.76 (0.53)		
16 or more	93 (26.3)	3.65 (0.65)		
Pharmacy Location			2.89*	0.004
Town area	183 (51.8)	3.82 (0.59)		
Housing area	170 (48.2)	3.64 (0.60)		
Type Pharmacy service			5.18	0.006
Independent retail pharmacy	190 (53.8)	3.66 (0.64)		
Consortium of independent pharmacies	81 (22.9)	3.72 (0.59)		
Corporate pharmacy	82 (23.2)	3.92 (0.49)		
Available pharmacy health care services			5.33	0.005
None	11 (3.1)	3.56 (0.50)		
Provide single pharmacy service	27 (7.6)	3.77 (0.60)		
Provide combination pharmacy services	315 (89.2)	3.25 (0.63)		
Online marketing placement			20.18	<0.001
Single online advertising platform	113 (32.0)	3.73 (0.61)		
Multiple online advertising platforms	166 (47.0)	3.89 (0.49)		
No online advertisement	74 (21.0)	3.39 (0.67)		
E-commerce placement			27.47	<0.001
Positioning in single e-commerce platform	153 (43.7)	3.83 (0.58)		
Positioning in multiple e-commerce platforms	82 (23.3)	3.99 (0.48)		
Never used e-commerce platform	115 (32.9)	3.43 (0.59)		
Perception of regulatory requirement towards business compatibility			2.31	0.058
Incompatible	117 (33.1)	3.84 (0.68)		
Less compatible	128 (36.3)	3.71 (0.50)		
Uncertain	93 (26.3)	3.61 (0.57)		
Compatible	10 (2.8)	3.99 (0.58)		
Highly compatible	5 (1.4)	3.78 (1.17)		

IV mean: score of behavioral interest towards e-pharmacy

Table 4: Participant's interest in providing online pharmacy services based on pharmacy healthcare services provisions

Variables	No interest (n=77, 21.8%)	Interest (n=276, 78.2%)	*Mean (SD)
Pharmacy healthcare services			
Single service	6 (7.8)	21 (7.6)	3.96 (1.06)
Multi services	63 (81.8)	252 (91.3)	4.18 (0.86)
No services	8 (10.4)	3 (1.1)	2.55 (1.63)

\*mean score of interest to adopt e-commerce for pharmacy services based on pharmacy healthcare services provisions  
 \*mean>3.00 was considered as interested to adopt e-commerce for pharmacy services, mean=3 as neutral, mean<3 as not interested to adopt e-commerce for e-pharmacy services.

experience in e-commerce market placement contributed to their interest in providing online pharmacy services. The e-market placement experience was categorised into (i) experience placing business in a single e-market platform; (ii) experience placing business in multiple e-market platforms; and (iii) no experience of using e-market platform for pharmacy business. The finding showed that pharmacies with experience in e-marketplace placement had contributed 73.6% to those with interest in providing online pharmacy services. Single platform and multiple platform experience pharmacies had a mean score of 4.21 (SD 0.79) and 4.52 (0.71), respectively. There were 115 (32.58%) respondents categorised under "without any experience in

e-marketplace placement" which had a mean score of 3.70 (SD 1.13). Furthermore, 62.61% of the respondents without e-marketplace experience were interested in providing online services. Each category had a mean score more than the neutral agreement (mean >3.00).

### Comparison of Behavioral Interest in Providing Online Pharmacy Services based on Online Advertising Experience

Table 6 summarised how the pharmacists experience in online advertising contributed to their interest in providing online pharmacy services. Their experience in online advertising was categorised into (i) experience promoting services in a

Table 5: Respondents' behavioral interest to provide online pharmacy services based on experience with e-commerce market placement

Variables	No interest (n=77, 21.8%)	Interest (n=276, 78.2%)	*Mean (SD)
E-market placement			
Single e-market platform	28 (36.4)	125 (45.8)	4.21 (0.79)
Multiple e-market platform	6 (7.8)	76 (27.8)	4.52 (0.71)
No e-market placement	43 (55.8)	72 (26.4)	3.70 (1.13)

\*mean score of interest to adopt e-commerce for pharmacy services based on experience with e-commerce market placement  
 \*mean>3.00 was considered as interested to adopt e-commerce for pharmacy services, mean=3 as neutral, mean<3 as not interested to adopt e-commerce for e-pharmacy services.

Table 6: Respondents' behavioral interest in providing online pharmacy services based on online advertising experience

Variables	No interest (n=77, 21.8%)	Interest (n=276, 78.2%)	*Mean (SD)
Online advertising platforms			
Single online platform	29 (37.7)	84 (30.4)	4.01 (0.99)
Multiple online platforms	22 (28.6)	144 (52.2)	4.34 (0.75)
No online advertising experience	26 (33.8)	48 (17.4)	3.76 (1.13)

\*mean core of interest to adopt e-commerce for pharmacy services based on online advertising experience  
 \*mean>3.00 was considered as interested to adopt e-commerce for pharmacy services, mean=3 as neutral, mean<3 as not interested to adopt e-commerce for e-pharmacy services.

single online advertising platform; (ii) experience promoting services in multiple online advertising platforms; and (iii) no experience in online advertising. The findings showed that 82.6% of pharmacies with online advertising experience had interest in providing online pharmacy services. Single platform and multiple platform pharmacies had a mean score of 4.01 (SD 0.99) and 4.34 (SD 0.75) respectively. There were 74 (20.96%) respondents categorised under the “no experience of online advertising” category which had a mean score of 3.76 (SD 1.13). Furthermore, 64.86% of the respondents from the “no online

advertising experience” category were interested in providing online pharmacy services. All categories had mean scores more than the neutral agreement (mean >3.00).

**Comparison of Behavioral Interest in Providing Online Pharmacy Services based on Perception of E-pharmacy Regulatory Requirements towards Business Compatibility**

Table 7 summarised how the community pharmacists' perception of regulatory requirements towards online pharmacy business compatibility influenced their interest in providing

Table 7: Respondents' behavioral interest in providing online pharmacy services based on their perception towards e-pharmacy regulatory requirements and business compatibility

Variables	No interest (n=77, 21.8%)	Interest (n=276, 78.2%)	*Mean (SD)
<b>Perception of regulatory requirement towards business compatibility</b>			
Incompatible	23 (29.9)	94 (34.1)	4.38 (0.88)
Less compatible	20 (26.0)	108 (39.1)	4.07 (0.75)
Uncertain	32 (41.6)	61 (22.1)	3.80 (1.13)
Compatible	1 (1.3)	9 (3.3)	4.30 (1.25)
Highly compatible	1 (1.3)	4 (1.4)	4.60 (0.89)

\*mean core of interest to adopt e-commerce for pharmacy services based on respondent's perception towards e-pharmacy regulatory requirements and business compatibility  
 \*mean>3.00 was considered as interested to adopt e-commerce for pharmacy services, mean=3 as neutral, mean<3 as not interested to adopt e-commerce for e-pharmacy services.

online pharmacy services. The community pharmacist's perception was based on the degree of agreement of their perception of regulatory requirements towards e-pharmacy business compatibility. From Table 7, it was shown that only 4.25% of the respondents (n=15) perceived regulatory requirements to be compatible with the e-pharmacy business. There were 245 respondents perceived regulatory incompatible (n=117, 47.76%) and less compatible (n=128, 52.24%) with the e-pharmacy business. However, from the respondents who perceived that the regulatory requirements were incompatible and less compatible, this study showed that 82.45% (n=202) from the groups were interested in providing online pharmacy services. All items had a mean score above the neutral agreement (mean >3.00).

### Association of Behavioral Determinants towards the Interest in Providing Online Pharmacy Services among Community Pharmacists

Based on Table 8, there were significant associations between consumerism norms ( $p=0.011$ ), socio-technology trends ( $p=0.0048$ ), business competition ( $p<0.001$ ) and e-pharmacy requirements compliance readiness ( $p<0.001$ ) towards pharmacists' interest in providing online services. Pharmacists with perception of consumerism norms had 1.62 times of tendency to have been influenced in providing online pharmacy services (95%CI: 1.12, 2.35). Pharmacist with perception of socio-technology trends had 1.51 times of tendency to have been influenced in providing online pharmacy service (95%CI: 1.00, 2.28). Pharmacist with

Table 8: Association behavior determinants towards pharmacists' interest in providing online pharmacy services

Variables	Crude OR (95%CI)	P value	Adjusted OR (95%CI)	P value
IV1: Perceived beneficial investment	2.95 (2.17, 4.02)	<0.001		
IV2: Perceived usefulness	2.94 (2.15, 4.01)	<0.001		
IV3: Consumerism norms	2.69 (1.99, 3.63)	<0.001	1.62 (1.12, 2.35)	0.011
IV4: Socio-technology trends	2.92 (2.15, 3.97)	<0.001	1.51 (1.00, 2.28)	0.048
IV5: Business competition	3.65 (2.61, 5.10)	<0.001	2.18 (1.43, 3.33)	<0.001
IV6: Resource availability	2.18 (1.66, 2.85)	<0.001		
IV7: Professional obligations	1.64 (1.32, 2.05)	<0.001		
IV8: Readiness for requirement compliance	3.79 (2.63, 5.45)	<0.001	2.63 (1.71, 4.06)	<0.001
IV9: Virtual health practice savviness	2.66 (1.97, 3.60)	<0.001		
IV10: Supportive policies from government	1.64 (1.30, 2.06)	<0.001		

perception of business competition had 2.18 times of tendency to have been influenced in venturing into online pharmacy services (95%CI: 1.43, 3.33). Pharmacist with perception of e-pharmacy requirement compliance readiness had 2.63 times of tendency to be interested in providing online pharmacy services (95%CI: 1.71, 4.06).

## DISCUSSION

This study explored community pharmacists' interest in providing online services. The study design featured demographic and inferential analysis from the perspective of e-commerce adoption theory, i.e., (i) beneficial investments, (ii) useful features, (iii) consumerism norms, (iv) socio-technology trends, (v) pressure from business competition, (vi) availability of resources, and (vii) government supportive policies. This study incorporated three dimensions related to motivation that influenced community pharmacists' interest in providing online services into the survey, i.e (i) professional obligation to patients' needs, (ii) readiness for compliance to requirements and (iii) virtual consultation savviness.

This study indicated that community pharmacists were experienced in placing their business in the digital environment. Community pharmacies had used e-commerce platforms to promote and sell their pharmaceutical products online. The findings showed that community pharmacies used multiple online advertising platforms to promote their services. As the e-commerce market increases its

economic traction, community pharmacies must use the opportunity to strategically position their professional roles as medicine experts in the digital health segment.

The survey indicated that community pharmacists perceived regulatory requirements as a significant role in motivating their interest to provide online pharmacy services. The data showed that a majority of the community pharmacists were interested in providing online services even though they acknowledged the e-pharmacy regulatory requirements were less friendly to their business provisions. Pharmacy authority must take into account that strict regulatory policies can impede economic business development. As such, business-friendly requirements should be incorporated into policy formulation, in tandem with the pharmacy professional ethics to ensure customer's health, safety and security.

The findings showed that community pharmacists were interested in providing online services which was similar with Ndem et. al. (2019) and Abanmy (2017) studies. However, additional findings in this study showed that community pharmacists' interest to provide online services may be influenced by perception of socio-technology trends, business competition, consumerism norms to subscribe e-pharmacy services and readiness in complying requirements for providing online services. These behavioral interest in online business acceptance were similar to those by Kit Yeng et al. (2015), Kurnia et al. (2015), Mohd Rizaimy et al. (2012), Rahayu

and Day (2015) and Tan et al. (2009), which the studies recommended that small retailers must accept online business practices and compete in the e-commerce market due to the market trends and business competition.

The e-retail operation compliments the overall pharmacy business by reducing the company's cost and allowing more efficient services, which it can ultimately increase the firm's value and profit (Alam et al. 2011). The business external pressures, i.e., market trends and business competition, had influenced pharmacy firm's direction to employ strategic investment in technology based on the resource's capacity and availability (Kurnia et al. 2015). Their knowledge in e-pharmacy requirements affected their readiness in providing online services (Zehnder et al. 2004). Consequently, this led to community pharmacists are interested to provide e-pharmacy services i.e. virtual health consultation, online medication adherence programs, online health supplementary related programs and medicine delivery services.

The current e-pharmacy policies are focused on illegal online advertisements, illegal online sale of unregistered pharmaceutical products and unauthorised sale of controlled medicines without a pharmacy license. These policies are lacking in empowering pharmacists as professional health care providers in a digital health segment.

This study implicated the lack of business-friendly policies by the government to empower e-pharmacy adoption among

community pharmacies. As the socio-technology trends and consumerism norms gravitate towards the online marketplace, it is paramount for the pharmacy authority to formulate economic policies that can generate a business conducive environment for online pharmacy practices. This will subsequently benefit the public in terms of ensuring availability of quality medicines at competitive prices which reduces medicinal costs for short and long-term medical treatments.

The pharmacy authority must consider liberating the pharmacy practice by enabling pharmacists to utilise communication technologies for easy access to medicinal consultation and health services. There is a need for public campaigns that encourage the use of pharmaceutical online services and promote pharmacy professional roles in the digital health segment. As the e-pharmacy service is still at its infancy, the pharmacy authority must consider the long-term and short-term policies required to develop a business-friendly regulatory framework for online professional health practices.

The limited response may be due to the short survey duration. Future studies must consider in using social media and internet messaging as well as a longer survey period duration to increase the response rate.

## CONCLUSION

E-pharmacy services include virtual dispensing of controlled medicines, online pharmacy medication and health related programs, virtual medication consultation and medicine

delivery services. There is currently a lack of policy to enable community pharmacies in providing e-pharmacy services. The findings from this study strongly indicated that community pharmacists were interested in providing e-pharmacy services. The interest among community pharmacists in providing e-pharmacy services were influenced by their believes in online market trends, business competition pressure and readiness to comply with regulatory requirements. As such, the pharmacy authority must consider to introduce business-friendly policies that can create a conducive business environment, in order to support community pharmacies to venture into e-pharmacy services. E-pharmacy services can improve public access to medicines and health related services. E-pharmacy benefits the public by introducing more options for medicinal products at competitive prices.

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