

ORIGINAL ARTICLE

Perception and Attitude of Malaysian Community Pharmacists Towards the Implementation of Telepharmacy

Wei Liang Ng, Wei Thing Sze

Faculty of Pharmacy, SEGi University Kota Damansara, Jalan Teknologi 47810 Petaling Jaya, Selangor, Malaysia

ABSTRACT

Introduction: Telepharmacy refers to the delivery of pharmaceutical care service through telecommunication to patients in locations where they may not have direct contact with a pharmacist. During the COVID-19 pandemic, the role of pharmacist has expanded to provide services remotely through telepharmacy. This study aimed to assess Malaysian community pharmacists' perception and attitude towards implementing telepharmacy. **Method:** This cross-sectional study was carried out from August 2020 to October 2020 using an online self-administered questionnaire. 217 community pharmacists in Klang Valley were recruited through convenience sampling method. 5-point Likert scales were used to evaluate the respondent's perceived benefits, perceived barriers and attitude towards the implementation of telepharmacy. **Results:** 37.8% of the respondents showed positive perception while 53.9% are moderately positive towards the benefits of telepharmacy. Age ($p=0.019$) was shown to impact on the perceived benefits on implementation of telepharmacy. Only 8.3% of the community pharmacists perceived low barriers in telepharmacy implementation and it was significantly associated with education level of the respondents ($p=0.032$). Younger community pharmacists and community pharmacists who have less years of working experience were more likely to have a positive attitude towards the implementation of telepharmacy ($p<0.001$). **Conclusion:** In conclusion, most Malaysian community pharmacists practicing in urban area has shown positive perception and attitude towards the benefits and implementation of telepharmacy. However, the perceived barriers towards its implementation is high. A separate training or education on telemedicine may be useful to promote the use of telemedicine to all the pharmacists.

Malaysian Journal of Medicine and Health Sciences (2022) 18(5): 72-78. doi:10.47836/mjmhs18.5.11

Keywords: Telepharmacy, Community pharmacist, COVID 19, Telemedicine, Telehealth

Corresponding Author:

Wei Thing Sze, MSc

Email: weithing@gmail.com

Tel: +60138119289

INTRODUCTION

Telemedicine is defined by the World Health Organisation as "the provision of remote healthcare services by healthcare professionals through the use of information and communication technologies to patients located at a distance (1). Telepharmacy, a term which is analogous to telemedicine, indicates a form of pharmaceutical care in which a patient can communicate with a pharmacist through the use of information technology (IT) applications (2). Many countries have expanded the role of community pharmacist during the COVID-19 pandemic to provide pharmaceutical care services remotely to patients through the use of telepharmacy(3). Telepharmacy is regarded by many as a way to increase access to pharmacists, hence reducing the risk of transmission of the virus by limiting face-to-face contact among individuals (4).

Telepharmacy services include but are not limited to, medicine use review, medication adherence, drug information services, patient counselling, refill authorisation for prescription drugs and therapeutic drug monitoring (1). The implementation of telepharmacy in the emergency response has helped to improve the health awareness of the general public towards COVID-19, such as symptoms of the disease as well as measures to reduce the spread of the virus in the community and referring them to appropriate healthcare facilities for testing if necessary (5). Telepharmacy is especially applicable in settings that perform medication-use activities when there are certain barriers that make face-to-face consultation impractical (6).

Furthermore, medication information and quality pharmaceutical services via telecommunications has an advantage of improving patient engagement and satisfaction (1). Telepharmacy has made it easy, convenient and flexible for patients to interact or follow-up with a pharmacist on site without physically attending the pharmacy at any desired time (7).

Despite the great potential of telepharmacy, there are several barriers to adopt telepharmacy and ultimately slow its diffusion into a healthcare system. The upfront cost for technologies such as hardware, software, connectivity and operational cost and continuous costs for maintenance and upgrades involves considerable amount of budget (8). Pharmacies that invest in telepharmacy services were concerned about lack of reimbursement and receiving a return on the investment made (9). Telepharmacy is also considered to be complex and requires healthcare professionals to learn new method of consulting (10).

To the best of the authors' knowledge, this research study is the first of its kind to investigate the perception and attitude of community pharmacist in Malaysia on the implementation of telepharmacy. In order to facilitate the implementation of telepharmacy in community pharmacies, information regarding the perception and attitude of community pharmacist towards implementation of telepharmacy is required. This research aimed to evaluate the perception and attitude of Malaysian community pharmacist towards implementation of telepharmacy in Klang Valley, specifically to assess the perceived benefits, perceived barriers and attitude of community pharmacists towards implementation of telepharmacy.

MATERIALS AND METHODS

Study Design and Setting

A cross-sectional online survey was carried out from September 2020 to November 2020. The target population of this study was the community pharmacists in Klang Valley. Klang Valley is a rapidly developing urban region in the peninsular Malaysia. The total community pharmacies within Klang Valley is 943, which is 32.6% of the total community pharmacies in Malaysia.¹¹ Each pharmacy outlet was expected to have at least 1 attending pharmacist on duty.

Sample Size and Sampling Method

A survey software tool, RaoSoft was used to calculate the sample size. The minimum sample size was calculated using a margin of error of 5%, confidence level of 95% and response distribution of 50% with a population size of 943. Hence, the minimum sample size calculated using RaoSoft is 274. 70% non-respondent rate was anticipated in this study, thus, the online questionnaire will be distributed to 466 community pharmacies through email. Convenience sampling method was applied in this study to achieve a higher response rate. A list of community pharmacies in Klang Valley was obtained from the website of Malaysian Pharmaceutical Society (11).

Inclusion and exclusion criteria

Participants who were fully registered pharmacist (FRP) under the Malaysian Pharmacy Board, currently

working in a community pharmacy within Klang Valley with at least 1 year of experience working in community pharmacy setting are included in this study. Participants who are provisionally registered pharmacist, pharmacy assistant, promoter, or sales assistant or those with less than 1 year of experience as a community pharmacist were excluded.

Study Tool

An online questionnaire was developed using Qualtrics, a software that assists in collecting and analysing data services for research purposes. The questionnaire consisted of 4 sections with a total of 45 items. Section A consisted of 8 questions to gain professional-demographic information of the participants such as age, gender, ethnicity, highest education level, years of service, type of pharmacy, familiarity with "telepharmacy" and types of telepharmacy services offered in their workplace. As for section B, C and D, it composed of 37 statements adapted from questionnaires that had been content validated by relevant experts (12-13). Section B assessed the level of agreement of the participants regarding their perceived benefits towards implementation of telepharmacy, whereas Section C assessed the level of agreement of the participants regarding their perceived barriers towards implementation of telepharmacy. Section D assessed the level of agreement of the participants regarding their attitude towards implementation of telepharmacy. All statements in the questionnaire were rated on a 5-point Likert scale (1 = Strongly Disagree, 2 = Disagree, 3 = Neutral, 4 = Agree, 5 = Strongly Agree).

A pilot study was conducted between 10th September and 21st September 2020 to assess the reliability and feasibility of the questionnaire by collecting data from 10% of the total sample size. 27 community pharmacists working in Klang Valley were randomly selected and recruited in the pilot study. Cronbach's alpha was used to measure the internal consistency of each section of the questionnaire after the pilot study was completed. Cronbach's alpha of 0.838, 0.853, and 0.836 was achieved for the questionnaires on perceived benefits, perceived barriers, and attitude respectively. All sections of the questionnaire had Cronbach's alpha of more than 0.8, which indicated that the questionnaire has a good internal consistency. Several constructive feedbacks from the participants were received and the questionnaire was amended accordingly such as rephrasing of statements to increase understanding before proceeding into the actual study.

Data Collection and Analysis

For data collection, an online questionnaire was distributed through email to each participant. After one week a reminder email was sent to non-respondents. Another 2 follow-up reminders through phone calls or messaging application will be conducted for unresponsiveness on each consecutive week respectively.

Inability to complete the online questionnaire after numerous reminders was considered as not interested in participating in the online questionnaire. Questionnaires which had a completion time of less than 2 minutes or standard deviation of zero for all answered statements were removed from the study.

As for data analysis, all data collected was analysed using Statistical Package for the Social Sciences (SPSS) Software, Version 26. A descriptive analysis on the demographic details of participants was conducted. In addition, descriptive analysis was used to analyse the mean and standard deviation of data collected from the questionnaire regarding the perceived benefits, perceived barriers and attitude of Malaysian community pharmacist towards implementation of telepharmacy. The scores for each statement was averaged to create a specific mean score and ranked accordingly to analyse the top perceived benefits, perceived barriers and attitude towards implementation of telepharmacy.

Chi-square test or Fisher-Freeman-Halton Exact test was used to analyse the factors associated with the perceived benefits, perceived barriers, and attitude towards implementation of telepharmacy. The scores for each section were compiled for each participants and the total scores achieved were categorised into 3 categories according to Bloom's cut-off point. The perceived benefits scores of the respondents were categorised into positive perception (40-50), moderately positive perception (30-40) and negative perception (<30). As for the perceived barriers, the scores were categorised into high perceived barriers (76-95), moderately perceived barriers (57-75) and low perceived barriers (<57). For the attitude, the specific mean score of less than 2.5 was labelled as negative attitude, 2.6-3.0 as neutral attitude, and greater than 3.0 as positive attitude (13). A p-value of less than 0.05 is considered as statistically significant. We further conducted a multivariate logistic regression analysis to explain the factors associated with the perception and attitude of implementation of telepharmacy, and the results were presented as odds ratio (OR) with 95% confidence intervals for each variable investigated.

Ethical Consideration

Ethical approval was obtained from XXXX University Ethics Committee before the study was conducted.

RESULTS

A total of 217 responses were collected with the response rate of 45%. Table I shows the distribution of respondents by demographic characteristics, familiarity to the term 'telepharmacy' and the type of telepharmacy services offered. The total sample size achieved in this study is 217. 37.8% of the respondents showed positive perception towards the benefits, 53.9% of the respondents showed moderately positive perception

Table I: Distribution of Respondents by Demographic Characteristics (N=217)

| Demographic Characteristics | Frequency (%) |
|---|---------------|
| Age Group (years) | |
| 20-29 | 97 (44.7) |
| 30-39 | 52 (24.0) |
| 40-49 | 43 (19.8) |
| 50-59 | 25 (11.5) |
| Gender | |
| Male | 78 (35.9) |
| Female | 139 (64.1) |
| Ethnicity | |
| Chinese | 164 (75.6) |
| Malay | 34 (15.7) |
| Indian | 14 (6.5) |
| Others | 5 (2.3) |
| Highest Education Level | |
| Bachelor's | 186 (85.7) |
| Master's | 31 (14.3) |
| Years of Experience | |
| 1-3 years | 79 (36.4) |
| 4-6 years | 34 (15.7) |
| 7-9 years | 21 (9.7) |
| 10 years and above | 83 (38.2) |
| Type of Pharmacy | |
| Chain Pharmacy | 122 (56.2) |
| Independent Pharmacy | 95 (43.8) |
| Familiarity with 'Telepharmacy' term | |
| Yes | 153 (70.5) |
| No | 34 (15.7) |
| Unsure | 30 (13.8) |
| Telepharmacy services offered | |
| Online Pharmacy | 87 (40.1) |
| Online Prescription Refill | 29 (13.4) |
| Remote Patient Counselling | 60 (27.6) |
| Medicine Use Review | 52 (24.0) |
| Medicine Adherence Monitoring | 19 (8.8) |
| Drug Information Services | 94 (43.3) |
| None of the above | 56 (25.8) |

while 8.3% expressed negatively towards the benefits of telepharmacy (Table II, III). Significant association was observed between the perceived benefits of respondents towards implementation of telepharmacy and age group ($p=0.019$). Further logistic regression analysis revealed that those who are of age 20-39 are 3.16 times more likely to perceive telepharmacy as beneficial than those who are of age 40-59 (95% CI OR 1.103- 9.047). As for perceived barriers, 26.3% of the respondents had high perceived barriers towards telepharmacy implementation, 65.4% of the respondents express moderate perceived barriers, while 8.3% perceived low barriers (Table IV, V). A significant association was observed between the perceived barriers of respondents towards implementation of telepharmacy and education level of respondent ($p=0.032$). Further logistic regression analysis revealed that those who have an undergraduate qualification are 5.2 times more likely to perceive telepharmacy as challenging than those who have a postgraduate qualification (95% CI OR 1.358- 19.910). Overall, the respondents showed a positive attitude with regards to the compatibility of telepharmacy in their work routine, and their attitude towards trying

Table II: Perceived Benefits towards Implementation of Telepharmacy (N=217)

| Statement | Mean Score (SD) |
|--|-----------------|
| Improve availability of health services | 4.14 (0.65) |
| Prevent unnecessary trips to access pharmacy services | 4.00 (0.73) |
| Improve the quality of health services | 3.92 (0.77) |
| Increase satisfaction of pharmacist and patients | 3.86 (0.81) |
| Assist medical services and prevention of disease | 3.81 (0.76) |
| Improve efficient training of pharmacists | 3.76 (0.77) |
| Help the decision-making and detection of drug-drug interactions | 3.70 (0.78) |
| Reduce health service cost | 3.70 (0.91) |
| Help in chronic disease control | 3.69 (0.87) |
| Reduce medical errors | 3.39 (0.96) |

Table III: Factors Associated with Perceived Benefits towards Implementation of telepharmacy

| Characteristics | Perceived Benefits (Frequency, %) | | | P-value |
|---|-----------------------------------|---------------------|-----------|---------------|
| | Positive | Moderately positive | Negative | |
| Age Group (years) | | | | 0.019* |
| 20-29 | 52 (53.6) | 41 (42.3) | 4 (4.1) | |
| 30-39 | 21 (40.4) | 27 (51.9) | 4 (7.7) | |
| 40-49 | 13 (30.2) | 26 (60.5) | 4 (9.3) | |
| 50-59 | 13 (52.0) | 7 (28.0) | 5 (20.0) | |
| Gender | | | | 0.866 |
| Male | 34 (43.6) | 37 (47.4) | 7 (9.0) | |
| Female | 65 (46.8) | 64 (46.0) | 10 (7.2) | |
| Education Level | | | | 0.196 |
| Bachelor's | 90 (48.4) | 85 (45.7) | 11 (5.9) | |
| Master's | 9 (29.0) | 16 (51.6) | 6 (19.4) | |
| Years of Experience | | | | 0.348* |
| 1-3 years | 42 (53.2) | 31 (39.2) | 6 (7.6) | |
| 4-6 years | 12 (35.3) | 19 (55.9) | 3 (8.8) | |
| 7-9 years | 12 (57.1) | 7 (33.3) | 2 (9.5) | |
| 10 years and above | 33 (39.8) | 44 (53.0) | 6 (7.2) | |
| Type of Pharmacy | | | | 0.176 |
| Chain Pharmacy | 56 (45.9) | 60 (49.2) | 6 (4.9) | |
| Independent Pharmacy | 43 (45.3) | 41 (43.2) | 11 (11.6) | |
| Familiarity with 'Telepharmacy' term | | | | 0.617* |
| Yes | 72 (47.1) | 68 (44.4) | 13 (8.5) | |
| No or Unsure | 27 (42.2) | 33 (51.6) | 4 (6.2) | |

out telepharmacy. The mean scores for all statements are above 3.0 (Table VI). Significant association was observed between the attitude of respondents towards implementation of telepharmacy with age and years of experience working in community pharmacy setting

Table IV: Perceived Barriers towards Implementation of Telepharmacy (N=217)

| Statement | Mean Score (SD) |
|---|-----------------|
| Lack of coordination between different health sectors | 4.18 (0.63) |
| Inability to integrate telepharmacy systems with pharmacy information system | 4.15 (0.71) |
| Lack of awareness of telepharmacy | 3.94 (0.81) |
| Insufficient training of pharmacists and patients regarding use of telepharmacy | 3.93 (0.77) |
| Problems with telepharmacy license | 3.86 (0.82) |
| Complexity of telepharmacy for patients | 3.84 (0.72) |
| Government's lack of knowledge about telepharmacy | 3.76 (0.86) |
| Lack of access to IT infrastructure | 3.76 (0.91) |
| Complexity of health service delivery processes | 3.74 (0.77) |
| Lack of pharmacist-technical staff to provide telepharmacy services | 3.74 (0.88) |
| Privacy and confidentiality issues | 3.72 (0.89) |
| Time limitation and lack of time to use telepharmacy | 3.69 (0.90) |
| Complexity of telepharmacy for non-pharmacists | 3.66 (0.77) |
| Problems in payments (insurance and repayments) | 3.65 (0.89) |
| Patients' resistance to use telepharmacy | 3.62 (0.84) |
| High cost of equipment and hardware needed for telepharmacy system | 3.54 (1.00) |
| High maintenance cost of telepharmacy system | 3.46 (0.89) |
| Complexity of telepharmacy for pharmacists | 3.30 (0.87) |
| Pharmacists' resistance to use telepharmacy | 3.27 (0.91) |

($p < 0.001$) (Table VII). Those who are of age 20-39 are 18.22 times more likely to have positive attitude towards implementation of telepharmacy than those who are of age 40-59 (95% CI OR 4.535- 73.220), and those who have 1-6 years of experience are 4.487 times more likely to have a positive attitude towards implementation of telepharmacy than those who have more than 7 years of experience (95% CI OR 1.581- 12.735).

Table V: Factors Associated with Perceived Barriers towards Implementation of Telepharmacy

| Characteristics | Perceived Barrier (Frequency, %) | | | P-value |
|---|----------------------------------|------------|-----------|---------------|
| | High | Moderate | Low | |
| Age Group (years) | | | | |
| 20-29 | 27 (27.8) | 63 (64.9) | 7 (7.2) | 0.466* |
| 30-39 | 11 (21.2) | 35 (67.3) | 6 (11.5) | |
| 40-49 | 13 (30.2) | 29 (67.4) | 1 (2.3) | |
| 50-59 | 6 (24.0) | 15 (60.0) | 4 (16.0) | |
| Gender | | | | |
| Male | 21 (26.9) | 51 (65.4) | 6 (7.7) | 1.000 |
| Female | 36 (25.9) | 91 (65.5) | 12 (8.6) | |
| Education Level | | | | |
| Bachelor's | 52 (28.0) | 132 (70.9) | 2 (1.1) | 0.032* |
| Master's | 5 (16.1) | 10 (32.3) | 16 (51.6) | |
| Years of Experience | | | | |
| 1-3 years | 25 (31.6) | 49 (62.0) | 5 (6.3) | 0.619* |
| 4-6 years | 6 (17.6) | 24 (70.6) | 4 (11.8) | |
| 7-9 years | 5 (23.8) | 13 (61.9) | 3 (14.3) | |
| 10 years and above | 21 (25.3) | 56 (67.5) | 6 (7.2) | |
| Type of Pharmacy | | | | |
| Chain Pharmacy | 34 (27.9) | 77 (63.1) | 11 (9.0) | 0.726 |
| Independent Pharmacy | 23 (24.2) | 65 (68.4) | 7 (7.4) | |
| Familiarity with 'Telepharmacy' term | | | | |
| Yes | 37 (24.2) | 103 (67.3) | 13 (8.5) | 0.558* |
| No or Unsure | 20 (32.2) | 37 (59.7) | 5 (8.1) | |

Table VI: Attitude towards Implementation of Telepharmacy (N=217)

| Statement | Mean Score (SD) |
|---|-----------------|
| Compatibility | |
| Telepharmacy is completely compatible with my current situation | 3.61 (0.84) |
| Telepharmacy is compatible with pharmacy services available in the pharmacy | 3.47 (0.86) |
| I think telepharmacy fits well with the way I like to work | 3.34 (0.91) |
| Using telepharmacy fits well into my current work style | 3.18 (0.86) |
| Total mean score | 3.40 |
| Trial ability | |
| I believe to try telepharmacy applications is a great opportunity | 3.82 (0.77) |
| I would like to try out telepharmacy services in retail setting | 3.75 (0.79) |
| I believe using telepharmacy on a trial basis is enough to see what it could do | 3.65 (0.70) |
| I do not have to take much effort to try out telepharmacy | 3.06 (0.89) |
| Total mean score | 3.57 |

Table VII: Factors Associated with Attitude towards Implementation of Telepharmacy

| Characteristics | Attitude (Frequency, %) | | | P-value |
|---|-------------------------|------------|-----------|-------------------|
| | Positive | Neutral | Negative | |
| Age Group (years) | | | | |
| 20-39 | 16 (20.5) | 53 (67.9) | 12 (8.1) | <0.001 |
| 40-59 | 28 (20.1) | 92 (66.2) | 16 (23.5) | |
| Gender | | | | |
| Male | 41 (22.0) | 129 (69.4) | 9 (11.5) | 0.889 |
| Female | 3 (9.7) | 16 (51.6) | 19 (13.7) | |
| Education Level | | | | |
| Bachelor's | 35 (31.0) | 65 (57.5) | 16 (8.6) | 0.099 |
| Master's | 70 (67.3) | 19 (18.3) | 12 (38.7) | |
| Years of Experience | | | | |
| 1-3 years | 27 (34.2) | 46 (58.2) | 6 (7.6) | <0.001* |
| 4-6 years | 8 (23.5) | 19 (55.9) | 7 (20.6) | |
| 7-9 years | 4 (19.0) | 14 (66.7) | 3 (14.3) | |
| 10 years and above | 66 (79.5) | 5 (6.0) | 12 (14.5) | |
| Type of Pharmacy | | | | |
| Chain Pharmacy | 29 (23.8) | 81 (66.4) | 12 (9.8) | 0.160 |
| Independent Pharmacy | 15 (15.8) | 64 (67.4) | 16 (16.8) | |
| Familiarity with 'Telepharmacy' term | | | | |
| Yes | 102 (66.7) | 30 (19.6) | 21 (13.7) | 0.099 |
| No or Unsure | 14 (21.9) | 43 (67.2) | 7 (10.9) | |

Statistical Method used: Chi Square Test and *Fisher-Freeman-Halton Exact Test

DISCUSSION

Perceived Benefits of Community Pharmacist towards Implementation of Telepharmacy

Implementation of telepharmacy have made pharmacy healthcare services more accessible in rural areas, as well as enhancing accessibility to disease management by pharmacists (14). Community pharmacists can help to triage and refer patients to higher level of care when diagnostic testing or further treatment is required as an attempt to reduce the burden of the healthcare system (5). Besides, numerous studies have indicated that the implementation of telepharmacy services can prevent unnecessary journeys to pharmacies for refills or consultation, which can save patient's time and money, improve their quality of life especially for patients with serious or chronic disease (4,15). Telepharmacy could improve the quality of health services. This is as a result of the quiet videoconferencing setting in which both the pharmacist and patient sat in a private and dedicated space with fewer interruptions as compared to a normal care setting where the pharmacists have other tasks to perform or no dedicated area for counselling (16). The least perceived benefit of telepharmacy implementation reported in this study aligns with a study conducted by Friesner, which concluded that there was no significant difference in rates of medication dispensing error between a pharmacy which has implemented telepharmacy and a traditional pharmacy (17).

Additionally, our findings was consistent with a survey done in Milan, where healthcare providers with higher seniority have shown less interest in implementing telemedicine and were not convinced that its implementation would improve clinical outcomes (18).

Perceived Barriers of Community Pharmacist towards Implementation of Telepharmacy

Pharmacists had revealed concerns about involvement of other units of health sector in telepharmacy (12), as lack of coordination from different health sectors can impede a successful implementation of telepharmacy. To provide effective pharmaceutical care, all actions need to be coordinated to reduce medical error and increase the quality of remote health care (19). The integration of telepharmacy system with pharmacy information system requires the harmonisation of the healthcare systems and related governing laws, as well as setting up proper rules and regulation (20). Besides, healthcare providers may not be knowledgeable or aware of telemedicine, which may be due to the lack of wide dissemination of information regarding telemedicine and its benefits for the public, as well as the lack of telemedicine experts in the healthcare sectors (21).

Community pharmacist who has a Master's qualification have lower perceived barriers of implementing telepharmacy, as compared to those with a Bachelor's qualification. This may imply that higher education level may lead to a broader view and understanding on the barriers faced in implementing telepharmacy. A separate telemedicine education or training may be useful to promote the development of telemedicine to all the pharmacists (21).

Attitude of Community Pharmacist towards Implementation of Telepharmacy

Positive attitude towards the use of telehealth in healthcare delivery had been reported (13). Majority of the respondents have stated that telepharmacy is compatible with the current situation in hand, which is the COVID-19 pandemic. Innovations in delivering health services in respect to telepharmacy are gradually recognised and gaining acceptability. Moreover, many of respondents have expressed the willingness to try out telepharmacy in a community setting. In a study done by Albarrak et al, 95% of its participants were willing to adopt telemedicine in their workplace to deliver healthcare services (22). Our findings were consistent with the study done by Biruk and Abetu, where 56% of healthcare provider within the age group of 20-29 showed positive attitude towards telemedicine (13). Younger people were shown to be more receptive to technology (23). Age has also been associated with problems in understanding the functions, the manuals and the terminology used in information technology (IT) as well as continuous change in the work situation (24).

Limitation of the Study

This study was completed by only 210 respondents,

which is 77% of the minimum sample size. The sample size did not based on the association between the independent and dependent variables. The association observed could be due by chance and there might be lack of power of the study. The online questionnaire was sent out to a total of 466 community pharmacists, however 55% of the selected candidate have refused to participate even after 3 times of follow-up reminders. This survey could not be carried out by approaching the community pharmacists on their premises due to movement restriction measures imposed by the government in light of the COVID-19 pandemic. Nevertheless, this study served as a useful preliminary data on perception of the Malaysian community pharmacists towards the implementation of telepharmacy. Convenient sampling method was employed in this study may introduced bias to the findings.

CONCLUSION

In conclusion, majority of the respondents has shown positive perception towards the implementation of telepharmacy. Resources and training should be funded and provided for its implementation to equip pharmacists with the skills to provide telepharmacy services. Future studies can be carried out by targeting different urban regions in Malaysia. Further study can also be conducted to survey on the willingness of community pharmacist to adopt telemedicine in rural areas.

ACKNOWLEDGEMENT

We thank the community pharmacists in Klang Valley that contributed in the pilot study and the actual study of this project.

REFERENCES

1. WHO Group Consultation on Health Telematics 1997: Geneva S. A health telematics policy in support of WHO's Health-for-all strategy for global health development : report of the WHO Group Consultation on Health Telematics, 11-16 December, Geneva, 1997. 1998 [cited 2020 Dec 15]; Available from: <https://apps.who.int/iris/handle/10665/63857>
2. Baldoni S, Amenta F, Ricci G. Telepharmacy Services: Present Status and Future Perspectives: A Review. *Medicina (Mex)* [Internet]. 2019 Jul 1 [cited 2020 Aug 3]; 55(7). doi: 10.3390/medicina55070327.
3. Gross AE, MacDougall C. Roles of the clinical pharmacist during the COVID-19 pandemic. *JACCP J Am Coll Clin Pharm.* 2020; 3(3): 564–6. doi: 10.1002/jac5.1274.
4. Ameri A, Salmanizadeh F, Bahaadinbeigy K. Telepharmacy: A new opportunity for consultation during the COVID-19 pandemic. *Health Policy Technol* [Internet]. 2020 Jun [cited 2020 Aug 3];

- doi: 10.1016/j.hlpt.2020.06.005.
5. Adunlin G, Murphy PZ, Manis M. COVID-19: How Can Rural Community Pharmacies Respond to the Outbreak? *J Rural Health* [Internet]. 2020 [cited 2020 Dec 17];n/a(n/a). doi:10.1111/jrh.12439
 6. Rogers H, Madathil KC, Agnisarman S, Narasimha S, Ashok A, Nair A, et al. A Systematic Review of the Implementation Challenges of Telemedicine Systems in Ambulances. *Telemed E-Health*. 2017 Sep; 23(9): 707–17. doi: 10.1089/tmj.2016.0248.
 7. Kurra P, Babu P. Telepharmacy: A Benefaction For Rural Healthcare Types of Tele Pharmacy. 2019 Mar 14; 60–4.
 8. Kane-Gill SL, Rincon F. Expansion of Telemedicine Services: Telepharmacy, Telestroke, Teledialysis, Tele-Emergency Medicine. *Crit Care Clin*. 2019 Jul; 35(3): 519–33. doi: 10.1016/j.ccc.2019.02.007
 9. Molfenter T, Boyle M, Holloway D, Zwick J. Trends in telemedicine use in addiction treatment. *Addict Sci Clin Pract*. 2015 Dec; 10(1): 14. doi: 10.1186/s13722-015-0035-4.
 10. Green T, Hartley N, Gillespie N. Service Provider's Experiences of Service Separation: The Case of Telehealth. *J Serv Res*. 2016 Nov; 19(4): 477–94. doi:10.1177/1094670516666674
 11. Malaysian Pharmaceutical Society [Internet]. [cited 2020 Aug 20]. Available from: <https://www.mps.org.my/index.cfm>
 12. Ameri A, Salmanizadeh F, Keshvaridoost S, Bahaadinbeigy K. Investigating Pharmacists' Views on Telepharmacy: Prioritizing Key Relationships, Barriers, and Benefits. *J Pharm Technol* [Internet]. 2020 [cited 2020 Aug 8]; doi:10.1177/8755122520931442
 13. Biruk K, Abetu E. Knowledge and Attitude of Health Professionals toward Telemedicine in Resource-Limited Settings: A Cross-Sectional Study in North West Ethiopia [Internet]. Vol. 2018, *Journal of Healthcare Engineering*. Hindawi; 2018 [cited 2020 Aug 20]. p. e2389268. doi: 10.1155/2018/2389268.
 14. McFarland R. Telepharmacy for remote hospital inpatients in north-west Queensland. *J Telemed Telecare*. 2017 Dec; 23(10): 861–5. doi: 10.1177/1357633X17732367.
 15. Niznik JD, He H, Kane-Gill SL. Impact of clinical pharmacist services delivered via telemedicine in the outpatient or ambulatory care setting: A systematic review. *Res Soc Adm Pharm*. 2018 Aug; 14(8): 707–17. doi: 10.1016/j.sapharm.2017.10.011.
 16. Lam AY, Rose D. Telepharmacy services in an urban community health clinic system. *J Am Pharm Assoc*. 2009 Sep; 49(5): 652–9. doi: 10.1331/JAPhA.2009.08128.
 17. Friesner DL, Scott DM, Rathke AM, Peterson CD, Anderson HC. Do remote community telepharmacies have higher medication error rates than traditional community pharmacies? Evidence from the North Dakota Telepharmacy Project. *J Am Pharm Assoc*. 2011 Sep; 51(5): 580–90. doi: 10.1331/JAPhA.2011.10115.
 18. Gaggioli A, di Carlo S, Mantovani F, Castelnuovo G, Riva G. A Telemedicine Survey among Milan Doctors. *J Telemed Telecare*. 2005 Jan; 11(1): 29–34. doi: 10.1177/1357633X0501100107.
 19. Mohammadzadeh N, Safdari R, Rahimi A. Cancer Care Management through a Mobile Phone Health Approach: Key Considerations. *Asian Pac J Cancer Prev*. 2013 Sep 30; 14(9): 4961–4. doi: 10.7314/apjcp.2013.14.9.4961.
 20. Omboni S, Tenti M. Telepharmacy for the management of cardiovascular patients in the community. *Trends Cardiovasc Med*. 2019 Feb; 29(2): 109–17. doi: 10.1016/j.tcm.2018.07.002.
 21. Bali S. Barriers to Development of Telemedicine in Developing Countries. In: F. Heston T, editor. *Telehealth* [Internet]. IntechOpen; 2019 [cited 2021 Jan 12]. doi:10.5772/intechopen.81723
 22. Albarrak AI, Mohammed R, Almarshoud N, Almujalli L, Aljaeed R, Altuwaijiri S, et al. Assessment of physician's knowledge, perception and willingness of telemedicine in Riyadh region, Saudi Arabia. *J Infect Public Health*. 2021 Jan 1; 14(1): 97–102. doi:10.1016/j.jiph.2019.04.006
 23. Fulk J. Social construction of communication technology. *Academy of Management Journal* 1993;36:921–50. doi:10.5465/256641
 24. Solberg LA, Natvig H, Endestad T, et al. IT Changes in Norwegian Firms: IT Quality and Users' Mastering of a New Technology. STF 78 A98405. Oslo: SINTEF Unimed, 1998