COVID-19 Knowledge, Attitudes, and Practices among Pharmacy Professionals in the Philippines Post-Exposure to Digital Awareness and Education

November 20, 2020

Executive Summary

Since March 2020, the Philippine health system has struggled to effectively manage the pandemic, with COVID-19 cases exceeding 380,000 in early November. Realizing that pharmacies remain an essential source of community health care during COVID-19, Johns Hopkins' Center for Communication Programs (JHUCCP) leveraged SwipeRx to engage pharmacy professionals in support of the country's pandemic response. As of early November 2020, more than 30,000 pharmacy professionals in the Philippines use the SwipeRx free mobile app. Leveraging the SwipeRx network, JHUCCP conducted two rounds of digital surveys to understand knowledge, attitudes and practices related to COVID-19. In between the two surveys, SwipeRx awareness and education content was deployed to address gaps identified in the first survey and promote COVID-19 guidance endorsed by the Department of Health (DOH). This report describes findings from the second digital survey including descriptive comparisons of knowledge, attitudes, and practices at baseline (May 2020) compared to the second survey (October-November 2020.) Between July-September 2020, SwipeRx was leveraged to deploy 92 awareness posters and one continuing professional development (CPD) module launched in September 2020 to address gaps in knowledge, attitudes and practices identified in the baseline COVID-19 survey. Due to the inability to interview a comparable sample of respondents through the baseline and second surveys, differences between the two rounds are descriptive and cannot be compared statistically. However, statistical analysis was possible to assess differences among second survey respondents exposed to the COVID-19 CPD compared to those who were not exposed to the CPD.

Among the second-round survey respondents, 84% were female and 90% were pharmacists, which is similar to the demographic distribution of the baseline sample in May 2020. Nearly all (96%) reported that they had seen COVID-19 related awareness posts. This is consistent with the fact that awareness content was deployed through the SwipeRx newsfeed function across multiple marketing channels. Recall was highest for messages related to the role of the pharmacy during COVID-19, preparing the pharmacy for the 'new normal', and specific protection measures recommended for pharmacies. In addition to high exposure to COVID-19 awareness content, 70% of the sample reported completing the COVID-19 CPD module on SwipeRx.

Although statistical comparisons between baseline and second-round results could not be reported, descriptive comparisons are included in this report to provide context for responses by pharmacy professionals after around three months of exposure. The second-round sample of pharmacy professionals had relatively high knowledge on COVID-19 basics covered in the SwipeRx awareness posts and CPD and answered questions correctly on common COVID-19 symptoms (94% second vs. 61% baseline), asymptomatic transmission (93% second vs. 87% baseline) and mask-wearing for protection even for healthy individuals (98% second vs. 86% baseline). However, similar to the baseline survey, more than a quarter of October to November respondents reported that antibiotics can be used to treat COVID-

19 and 82% reported inappropriate referral of a young client with mild symptoms to a hospital (instead of advising self-isolation.) These findings are understandable given the fact that the SwipeRx COVID-19 awareness posts and CPD did not focus on these topics. A question added to the second-round survey also revealed low knowledge levels regarding rapid COVID-19 tests. Only 55% correctly answered questions about COVID-19 rapid tests and 19% did not know that rapid tests cannot be sold in pharmacies. Average knowledge scores were not statistically significant between respondents who completed the COVID-19 CPD compared to respondents who had not completed the CPD. This may be due to widespread exposure to awareness posts covering similar content.

Among second-round pharmacy professionals, 80% described the scenario of them becoming infected with COVID-19 as serious or very serious, yet 83% expressed confidence that they could protect themselves from infection. 97% reported believing that the pharmacy has a role to play in COVID-19. Respondents who had completed the COVID-19 CPD were significantly more likely to report this belief, compared to respondents who did not take the CPD ($U=6447$, $p=0.018$).

After three months of exposure to the SwipeRx awareness campaign and the first month of access to the CPD, pharmacy professionals reported high levels of practicing COVID-19 protection measures such as wearing a face mask (100% both samples), washing hands frequently (99% both samples) and cleaning surfaces frequently (96% second vs. 94% baseline.) In addition, 76% of the sample indicated that these practices were motivated by content seen on SwipeRx. Questions were added to the second-round survey to assess results associated with specific content addressed through the SwipeRx COVID-19 awareness posts and CPD. Answers to these questions revealed that most respondents reported preparing their pharmacy to provide safer care by installing transparent plastic shields on their counters (94%), advising staff to wear PPE (87%), or placing marks on the floor to indicate safe distances (84%). Pharmacy professionals also reported taking extra measures to ensure consistent pharmacy supplies by preparing a list of substitute products which were hardest to source (80%), keeping a list of alternative suppliers (74%), and checking suppliers' inventory periodically (67%). More than 3 out of 5 respondents attributed these practices to content seen on SwipeRx. Statistical differences were not detected for these practices among respondents who completed the CPD compared to those who did not complete the CPD. This finding may be related to the fact that all respondents were exposed to similar messages through the awareness posts.

The results of the October to November 2020 SwipeRx COVID-19 survey in the Philippines indicate that three months after launching COVID-19 awareness posters and a CPD on SwipeRx, basic COVID-19 knowledge, attitudes, prevention practices, and pharmacy management practices were high, although gaps remain. Future SwipeRx awareness and CPD content should focus on guiding pharmacy operators to help their clients with COVID-19 symptoms seek appropriate care, promoting antimicrobial stewardship, promoting handwashing or sanitation practices, and guiding pharmacy contributions to COVID-19 rapid-testing and vaccine uptake consistent with MOH guidelines. The study also presents

learnings relevant to future evaluations of digital awareness and education initiatives. The second-round survey was not planned with significant time or resources to facilitate statistical comparisons between baseline and second-round survey takers. Efforts to assess changes in knowledge, attitudes and practices associated with exposure to SwipeRx awareness and education content would benefit from the following methodological refinements: i) including an evaluation component in a program from the initial design phase, to facilitate advance planning and optimal methodology; ii) extending the exposure period between two surveys to allow adequate time for learning and behavior change to take place among survey respondents; and iii) incorporating a control group where possible.

Background

As of early November 2020, the Philippines had exceeded 380,000 confirmed COVID-19 cases, with sustained community transmission concentrated in the National Capital Region, CALABARZON, Central Visayas, and Central Luzon.[1,2] Throughout varying degrees of community lockdowns since March 2020, the country has been unable to drastically reduce transmission. As a first point of care for many communities, the pharmacy can play a defining role in patient management and health system support, to curtail COVID-19 progression.[3]

In this context, Johns Hopkins' Center for Communication Programs (JHUCCP) leveraged mClinica's digital network of pharmacies to improve pharmacy professionals' knowledge, attitudes and practices related to COVID-19. In the Philippines, SwipeRx is a free mobile app used by more than 30,000 pharmacy professionals nationwide.[4] The app features newsfeed, social media messaging, continuing professional education modules, and a drug directory tool. Using May 2020 COVID-19 baseline research findings, along with Department of Health (DOH) guidelines, JHUCCP and mClinica designed and deployed digital awareness campaigns covering topics on the role of the pharmacy during COVID-19, risk reduction measures, and DOH guidance on rapid testing, self-isolation, and referrals, as well as a continuing professional development (CPD) education module on COVID-19 basics, preparing the pharmacy for the "new normal", and tips on pharmacy operation and maintaining drug supply through the pandemic. According to the most recent progress report, between July – October 2020, there were 37,927 points of engagement for the 92 awareness posters measured through the SwipeRx app and social media channels. Since being launched in September 2020, 1,370 pharmacy professionals accessed the CPD module on SwipeRx and among those who completed the post-CPD assessment, 92% of users passed and received CPD accredited units, if they were eligible.

[1] https://coronavirus.jhu.edu/map.html
[2] file:///C:/Users/CMOT/Downloads/who-phl-sitrep-59-covid-19-27october2020.pdf
[3] Miller, R., and Goodman, C. "Performance of retail pharmacies in low- and middle-income Asian settings: a systematic review." Oxford Journals, Health Policy and Planning. 2016 Sep; 31(7): 940–953.
[4] As of November 2020

To understand the effect of COVID-19 awareness and education deployed through SwipeRx, JHUCCP leveraged SwipeRx to conduct a digital survey among pharmacy professionals between October to November 2020, after three months of access to COVID-19 content through SwipeRx marketing channels. This report describes the results of the October to November 2020 SwipeRx survey, descriptively comparing the baseline May 2020 findings with these second-round survey results. The report also includes an assessment of the extent to which pharmacy professionals who completed the COVID-19 CPD through SwipeRx reported higher levels of COVID-19 knowledge, attitudes or practices compared to professionals who did not complete a CPD in the same time period.

Methods

The second-round survey involved data collection from pharmacists, pharmacy assistants, pharmacy managers, and pharmacy owners who were registered on the mobile app, SwipeRx, between October 16, 2020 to November 6, 2020.

Survey Development

The survey tool for this study was developed with JHUCCP. The questionnaire included 10 questions on demographics, 5 questions on SwipeRx COVID-19 content exposure and recall, 13 questions on knowledge, 7 questions on attitudes and beliefs, and 11 questions on current practices. The survey was designed to facilitate comparison with the May 2020 survey results and was pre-tested with 3 Filipino pharmacy professionals to improve question comprehension and flow.

Survey Administration and Survey Sampling

The survey was deployed using a survey platform tool called Qualtrics. It was administered through the SwipeRx mobile application, available to all SwipeRx users meeting the inclusion criteria. Online recruitment activities consisted of electronic invitations sent by SwipeRx app notification pushes to users who completed COVID-19 CPDs as well as recently active users who did not participate in any COVID-19 education on SwipeRx.

Survey respondents received a modest incentive of 200 PHP as compensation for their time. Incentives were distributed following completion of at least 80% of the survey questions, as phone credit directly to the number provided by respondents. A total sample of 270 pharmacy professional respondents was needed for a 90% confidence level and a 5% margin of error.

Data Analysis

Survey data was analyzed using Stata 16 (StataCorp LLC). Descriptive comparisons were made between the May 2020 and October-November 2020 survey results to gauge possible changes in knowledge,

attitude, and practice levels over the three months of COVID-19 content exposure on SwipeRx. Statistical comparisons between baseline and second-round responses were not possible because the same survey respondents were not followed for the two survey rounds. In addition, the responses from the October to November 2020 survey were analyzed retrospectively according to the level of SwipeRx COVID-19 education completed. For this analysis, a binary variable was created to categorize users who completed the COVID-19 CPD module on SwipeRx and users who did not complete the COVID-19 CPD. Since access to COVID-19 awareness posters were deployed through SwipeRx newsfeed functions and therefore were accessed by the majority of respondents, it was not possible to stratify responses by access to awareness content.

Descriptive analysis was completed against all demographic variables resulting in the calculation of median values for continuous variables and proportional responses for categorical variables. Proportional responses for questions related to knowledge, attitudes, and practices were also calculated. Chi-squared tests and Mann Whitney U-tests were used to assess statistical differences in categorial and continuous responses considering COVID-19 education level on SwipeRx for the second-round survey responses only. P-values less than 0.05 were considered statistically significant.

Ethical Approvals

This protocol was approved by the Johns Hopkins University Institutional Review Board on 20th September 2020.

Limitations

Digital surveys provide many benefits. In addition to convenience, they allow researchers to collect reasonably large samples more quickly and inexpensively compared to non-digital surveys. Even in the context of COVID-19 and related restrictions, the online recruitment method used for this research made data collection in a three-week period feasible. However, some limitations warrant consideration.

First, the mobile approach may bias respondents toward younger and more technologically savvy users with good internet connection. Further, the sample may have been predisposed to self-selection bias because respondents may have had higher interest in COVID-19, and thus may be more knowledgeable about the survey topics compared to the population average. In addition, individuals who had completed the COVID-19 CPD were oversampled to facilitate comparison of knowledge, attitudes and practices among individuals exposed to the CPD content. For these reasons, the findings may not be generalizable to the entire population of pharmacy professionals in the Philippines or on SwipeRx.

Although the sample distribution of demographic variables of interest among the May 2020 respondents and October to November 2020 respondents are similar across gender, professionals background, age, and region, statistical differences could not be analyzed because there was not sufficient time to plan a

comparable follow-up sample of pharmacy respondents. Thus, only descriptive comparisons were made on the results between the two rounds.

Results

Participant Demographics and Workplace Background

Among the 299 respondents who completed the second survey, 84% were female and 90% were pharmacists. The median age of the October-November 2020 sample was 26 years. These demographic variables are similar to the baseline sample collected in May 2020 (Table 1). Descriptively, there were fewer respondents from Metro Manila and more from other parts of Luzon in the second survey, compared to the baseline. Approximately 1 out of every 3 respondents in the second survey worked in a big chain pharmacy, compared to 1 in 2 among the baseline sample.

Table 1: SwipeRx Sample Demographics

Question	Baseline Survey Responses (May 2020)	2nd Round Survey Responses (Oct-Nov 2020)
Gender	**n = 302**	**n = 299**
Male	20%	16%
Female	80%	84%
Professional Background	**n = 306**	**n = 299**
Pharmacist	87%	90%
Pharmacy assistant	11%	8%
Pharmacy owner or manager	2%	1%
Region	**n = 297**	**n = 299**
Metro Manila	34%	24%
Luzon (outside of MM)	40%	56%
Visayas	19%	11%
Mindanao	7%	9%
Main Workplace	**n = 305**	**n = 299**
Big chain pharmacy (≥5 branches)	50%	31%
Small chain pharmacy (2-4 branches)	8%	10%
Independent retail pharmacy (1 branch)	15%	19%
Hospital or other health facility pharmacy	25%	27%
Other	3%	13%

Based on recall of the past week (prior to the survey), pharmacy professionals interviewed in the second survey reported a median of 100 clients (IQR=50-200 clients) visiting their pharmacy per day. Of these, around 22 clients (IQR=8-52 clients) asked for advice related to COVID-19, 14 clients (IQR=5-45 clients) complained about dry cough, fever, or shortness of breath, and 31 clients (IQR=11-65 clients) purchased products that treat symptoms of fever or cough. Whereas there was no change in overall pharmacy client traffic compared to the baseline, the number of clients requesting advice about COVID-19 and purchasing products that treat COVID-19 symptoms increased from the baseline level (10 clients/day and 20 clients/day respectively.)

In comparison to pre-COVID-19 (before March 2020) pharmacy traffic, 32% of baseline respondents in May thought there was much more client volume while 7% of the of second-round respondents in October to November felt that they received many more clients.

Almost all (96%) of second survey respondents reported that they had seen COVID-19 related awareness posts through one of the SwipeRx marketing channels. Among these, 88% reported seeing awareness content on the SwipeRx app, 60% reported seeing content on the SwipeRx Instagram page, and 13% reported seeing content on the SwipeRx Facebook page. The most commonly recalled awareness posts related to the role of the pharmacy professional during COVID-19, preparing the pharmacy for the 'new normal', specific pharmacy protection measures, COVID-19 symptoms, and the COVID-19 vaccine. 70% of the sample had completed the COVID-19 CPD module on SwipeRx.

Pharmacy Professionals' Knowledge

After three months of COVID-19 awareness deployment on SwipeRx, pharmacy professionals reported higher levels of knowledge regarding symptoms, transmission, and prevention (Table 2). While statistical comparisons for the baseline vs. second-round survey was not possible due to the study methods, descriptive comparisons between the two rounds are presented to provide context for the results of the second survey. 94% of the sample who completed the second survey were able to correctly identify three common symptoms of COVID-19, compared to 61% among the baseline sample. The second-round respondents were slightly more likely to know about asymptomatic transmission (93%) compared to the baseline respondents (87%) and about the importance of protective mask-wearing for healthy individuals (98% second vs. 86% baseline). Virtually all respondents from both samples acknowledged the importance of handwashing and mask-wearing among those who are sick. Areas where knowledge levels remained relatively low after three months of exposure to COVID-19 awareness included recommended care-seeking for mildly symptomatic individuals and COVID-19 treatment. Among the second-round sample, those who had completed a COVID-19 CPD on SwipeRx were significantly more likely to inappropriately recommend care seeking for young and healthy individuals with COVID-19 symptoms at the hospital, than those who did not complete a CPD ($\chi 2$ = 11.58, p=0.001, Appendix Table 2). This finding may be related to the fact that the CPD did not cover recommended scenarios for referring

suspected COVID-19 cases but instead focused on COVID-19 etiology and practical tips on pharmacy operation management to keep clients and staff safe.

Knowledge levels did not differ significantly among second survey respondents who had completed the COVID-19 CPD compared to respondents who had not completed the CPD. This might be related to the fact that nearly all respondents were exposed to the awareness content, which covered several of the same COVID-19 information that was also covered in the CPD, possibly confounding the ability to detect differences attributable to CPD exposure alone.

Table 2: Knowledge Regarding COVID-19 Symptoms, Transmission, and Prevention

Question	Baseline Survey Responses (May 2020)	2nd Round Survey Responses (Oct-Nov 2020)
What are three common symptoms of COVID-19? (select multiple)	n=305	n = 298
Fever*	97%	100%
Constant sneezing	30%	5%
Dry cough*	97%	98%
Nausea	11%	1%
Coughing blood	5%	0%
Shortness of breath or difficult breathing*	98%	96%
% of respondents who selected only correct (*) answers	61%	94%
Only those who are displaying symptoms of COVID-19 are able to transmit the disease to another person.	n = 304	n = 298
True	13%	7%
False*	87%	93%
Antibiotics can fully or at least partially treat COVID-19.	n = 304	n = 295
True	30%	26%
False*	70%	74%
Washing your hands for at least 20 seconds is recommended to protect against infection.	n = 303	n = 296
True *	97%	97%
False	3%	3%
If a young adult with no pre-existing respiratory conditions is displaying even mild symptoms of COVID-19, such as dry cough, fever, or shortness of breath, they should still seek care at the hospital.	n = 304	n = 296**
True	87%	82%
False*	13%	18%

If a person is healthy and not a healthcare worker or care giver, the recommendation is still to wear an appropriate face mask for protection.	n = 303	n = 297
True*	86%	98%
False	14%	2%
If a person is sick, it is recommended that they wear an appropriate mask when they are around other people, to limit the spread of viral particles.	n = 300	n = 292
True*	99%	100%
False	1%	0%
How can COVID-19 be transmitted from person to person?	--	n = 298
By inhaling droplets in the air from an infected person who coughs or sneezes		1%
By touching a surface or object that is contaminated with the virus and then touching the mouth, nose, or eyes		2%
Being in very close proximity with an individual who is infected with COVID-19		< 1%
All of the above*		97%
What is the recommended minimum distance between two people practicing social distancing?	--	n = 298
Approx. 0.5 meters		< 1%
Approx. 1-2 meters*		83%
Approx. 3-4 meters		8%
Approx. 5-6 meters		9%

*Denotes the correct answer

Additional questions were added to the second survey considering the specific content deployed through the awareness and CPD material (Table 3). Among second survey respondents, 92% were able to correctly identify the specific ways pharmacy professionals can contribute to the COVID-19 response. 46% understood the difference between self-isolation and self-quarantine and 25% thought the two terms meant the same thing. 55% correctly answered questions about COVID-19 rapid tests and close to 1 in 5 (19%) were unaware that rapid tests cannot be sold legally in pharmacies.

The median knowledge score among the second-round sample was 77%: based on 10 out of 13 knowledge-related questions answered correctly. Average knowledge scores did not differ significantly based on whether respondents had completed the COVID-19 CPD through SwipeRx or not.

Table 3: Added Questions on Knowledge Regarding Appropriate Testing and Care-seeking Recommendations for Pharmacy Clients with COVID-19 Symptoms

Question	2nd Round Survey Responses (Oct-Nov 2020)
What is the difference between recommended self-isolation and self-quarantine practices?	**n = 296**
Self-isolation is recommended for those with COVID-19 symptoms who have recently been exposed, while self-quarantine is recommended for those with COVID-19 symptoms and have NOT been recently exposed	9%
Self-isolation is recommended for those with COVID-19 symptoms who have recently been exposed, while self-quarantine is recommended for those with NO COVID-19 symptoms and have been recently exposed*	**46%**
Self-isolation is recommended for those with NO COVID-19 symptoms and have been recently exposed, while self-quarantine is recommended for those with COVID-19 symptoms and have been recently exposed	20%
Either/both of these is recommended, as the terms mean the same thing	25%
Which of the following statements are true about COVID-19 rapid tests. (multiple response possible)	**n = 297**
Clients can purchase COVID-19 rapid tests online	2%
COVID-19 rapid tests can be sold legally in some pharmacies	19%
COVID-19 rapid tests work by detecting the presence of antibodies in an individual's blood serum*	83%
Positive COVID-19 rapid test results need to be confirmed by a PCR test in a health facility*	89%
% of respondents who selected only correct (*) answers	**55%**
What are some ways that you can protect clients at your pharmacy?	**n = 297**
Advise clients to avoid visiting the pharmacy if they are elderly or have co-morbidities and suggest that a family member or friend go to the pharmacy for them	< 1%
Limit access to products on self-selection to pharmacy personnel in order to avoid multiple people touching these products	0%
Place a notice at the entrance of the pharmacy with recommendations for clients such as disinfecting their hands before entering, avoiding close contact while in the pharmacy, and preparing prescriptions in advance	7%
All of the above*	**92%**

Pharmacy Professionals' Attitudes

Respondents from the second survey expressed high levels of fear about COVID-19 while simultaneously expressing their belief that pharmacies have a role to play in the COVID-19 response in the Philippines. 87% expressed fear of being infected but 97% agree or strongly agree that pharmacy professionals played an essential role in COVID-19 care. Respondents who had completed the COVID-19 CPD were

significantly more likely to strongly agree that pharmacy professionals play an essential role in COVID-19 care, compared to respondents who did not take the CPD (U=6447, p=0.018, Appendix Table 3 & Figure 1). No other statistically significant differences were found in reported attitudes among respondents who completed the COVID-19 CPD compared to respondents who did not complete the CPD.

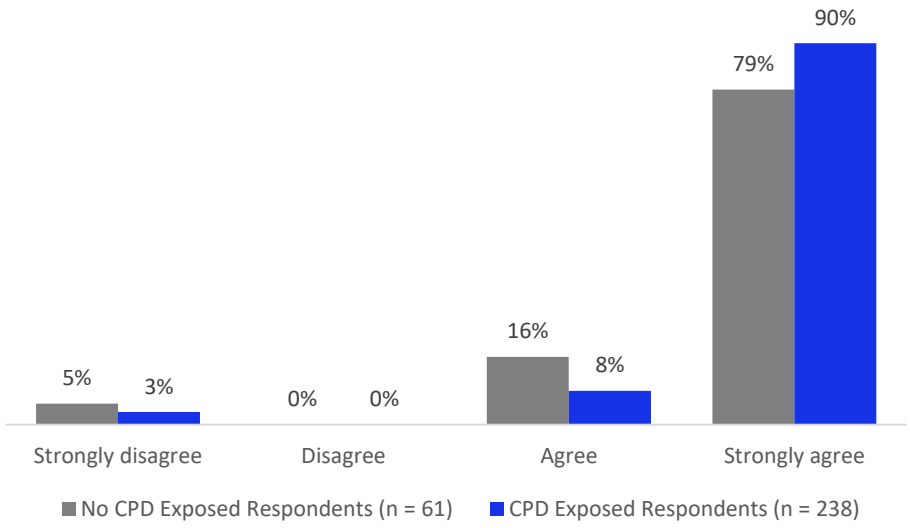


Figure 1: Proportion of Respondents who Agree with the Statement "I believe that pharmacies and pharmacy professionals play an essential role in the response to COVID-19" by CPD Exposure Status

Additional questions were incorporated into the second survey to assess attitudes related to COVID-19 perceived risk and preparedness among pharmacy professionals. Responses to these questions clarified that 80% of pharmacy professionals reported believing that it would be serious or very serious if they became infected with COVID-19 (**Error! Reference source not found.**) and a little over half (53%) reported believing that it was likely or very likely that they would become infected with COVID-19 (**Error! Reference source not found.**). Nevertheless, 83% revealed confidence that they can protect themselves from infection (**Error! Reference source not found.**). No statistical significance was detected across the answers to these questions based on exposure to the COVID-19 CPD.

Figure 2: Perceived Severity of COVID-19 Infection among Pharmacy Professionals

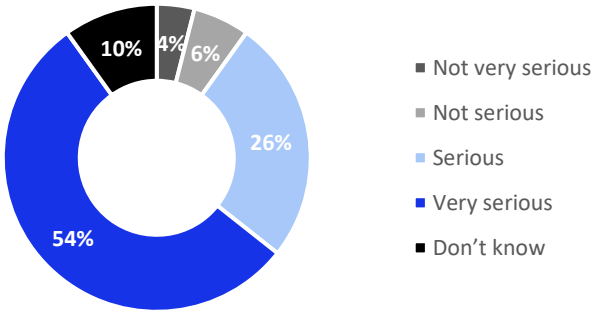


Figure 3: Perceived Risk of COVID-19 Infection among Pharmacy Professionals

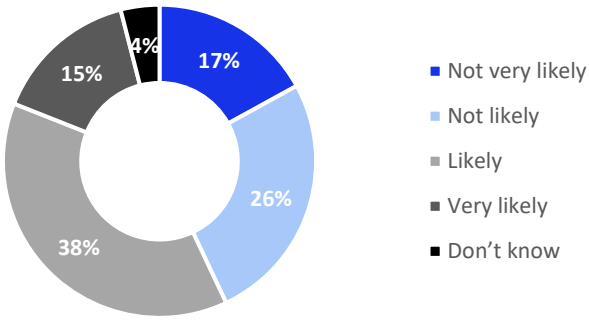
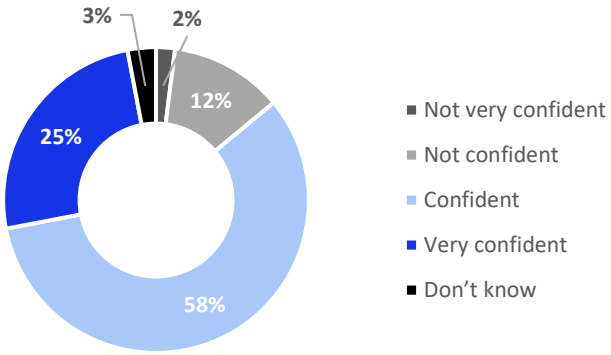


Figure 4: Confidence in Ability to Protect Oneself from COVID-19 Inection among Pharmacy Professionals



An open-text question was added to the second survey to understand what would make respondents feel more confident that they were protected from COVID-19. Respondents explained that knowing and practicing recommended protection measures would increase their confidence that they are sufficiently preventing infection. Respondents provided qualitative feedback indicating that they perceived the SwipeRx CPD as motivating this confidence.

> "After participating in the COVID-19 (CPD) module my level of confidence … increased because the module provided me with excellent knowledge about the existing pandemic"

> "Having knowledge about how to handle COVID-19 made me feel confident that I can protect myself from infections. Following protocols like proper hygiene and disinfecting is [part] of my daily routine [regardless of whether] I'm at home or in the pharmacy or even in public market."

> "[I feel more confident that I am protected when] using a face mask, disinfecting, washing my hands often, taking vitamins that helps in boosting my immune system, … and eating healthy foods."

In addition, greater community compliance to COVID-19 measures and leadership support from employers to address employee COVID-19 related concerns were also identified as measures—outside of the control of pharmacy operators—that could reduce their perceived risk.

> "I would feel very confident about protecting myself if everyone around me, my family, neighbors, etc. would know how to properly act and take care of themselves as well."

> "[I feel more confident I am protected if there was more] concern from my company [and] additional guidelines from our head office."

Pharmacy Professionals' Practices

There was high reported practice of COVID-19 protection measures among second-round respondents such as wearing a face mask (100%), requiring clients to wear masks (95%), washing hands frequently (99%), and cleaning surfaces frequently (96%.) In addition, 76% of respondents acknowledged that these practices were motivated by content seen on SwipeRx. No statistically significant differences in reported practices were found between respondents who completed the COVID-19 CPD compared to those who did not complete the CPD. This is not surprising given the fact that reported COVID-19 prevention practices were high among respondents from both surveys. The COVID-19 CPD did not focus on client management or requirements for appropriate referrals or isolation, but instead emphasized COVID-19 basics and safely operating pharmacies during the pandemic. In addition, as discussed in the final section, the limited time between CPD exposure and second survey deployment likely limited changes in practices.

Table 4: Reported Practices Regarding Individual and Pharmacy COVID-19 Protection Measures and Client Recommendations

Question	Baseline Survey Responses (May 2020)	2nd Round Survey Responses (Oct-Nov 2020)
What measures do you currently take to protect yourself from COVID-19? (multiple response possible)	**n = 305**	**n = 298**
Wear a face mask	100%	100%
Require pharmacy clients to wear masks	--	95%
Wash hands frequently	99%	99%
Use hand sanitizer	92%	93%
Clean surfaces frequently	94%	96%
Other, please specify	29%	26%
Were any of the measures you mentioned in the previous question motivated in part by content you saw on SwipeRx?	**--**	**n = 298**
No		24%
Yes		76%
If a pharmacy client has mild COVID-19 symptoms, such as dry cough, fever, or shortness of breath, what would you do or recommend? (multiple response possible)	**n = 305**	**n = 298**
Refer them to the nearest health facility for consultation with a physician	81%	78%
Encourage them to stay home	72%	75%
Encourage them to practice social distancing	86%	81%
Offer them medicine to treat symptoms	49%	48%

Encourage them to wash their hands and avoid touching their face	83%	83%
Dispense them antibiotics	1%	1%
Encourage them to wear a mask if they have them	90%	89%
Offer them vitamins or other "immune-boosting" supplements	82%	86%
Other, please specify	5%	4%
I would not know what to recommend	0%	0%
If a pharmacy client has severe COVID-19 symptoms such that day to day function is impaired, what would you do or recommend? (multiple response possible)	**n = 305**	**n = 298**
Refer them to the nearest health facility for consultation with a physician	97%	97%
Encourage them to stay home	34%	36%
Encourage them to practice social distancing	66%	62%
Offer them medicine to treat symptoms	28%	30%
Encourage them to wash their hands and avoid touching their face	63%	62%
Dispense them antibiotics	2%	1%
Encourage them to wear a mask if they have them	72%	71%
Offer them vitamins or other "immune-boosting" supplements	57%	62%
Other, please specify	4%	5%
I would not know what to recommend	0%	0%

Similar to the baseline responses, most of the second survey respondents noted that their pharmacy had implemented or shared COVID-19 specific guidelines aimed to protect their staff from infection (Table 4). In May 2020, as reported by survey respondents, only 37% identified that there was a nearby health facility with testing capacity, whereas in response to the second survey, 68% of pharmacy professionals reported that there was a health facility that provided testing within a 30-minute drive from their pharmacy. Further, while 25% of baseline respondents noted that many or most of their suppliers had reduced their business operations in the earlier months, only 13% among the second-round respondents had revealed decreased supplier operations later in the year.

Table 4: Factors Influencing Pharmacy COVID-19 Practices

Question	Baseline Survey Responses (May 2020)	Second Survey Responses (Oct-Nov 2020)
Has your pharmacy implemented or shared guidelines or policies to protect working pharmacy professionals from COVID-19 infection?	**N = 305**	**n = 298**
No	4%	2%
Yes	96%	98%
Do you know of a health facility near you that offers COVID-19 testing?	**N =304**	**n = 297**
Yes, there is at least one health facility with testing within a 30 minute drive from my pharmacy	37%	68%
No, there are no health facilities with testing within a 30 minute drive from my pharmacy	28%	9%
There is at least one health facility within a 30-minute drive from my pharmacy, but I do not know whether they have testing	11%	10%
The nearest health facility is greater than a 30-minute drive from my pharmacy	23%	13%
In the past month, have any of your pharmacy's wholesalers or distributors reduced functions or completely stopped operations, due to COVID-19?	**N = 304**	**n = 297**
None	14%	21%
Few	61%	65%
Many	17%	10%
Most	8%	3%

Four questions were added to the second survey considering specific content deployed through SwipeRx awareness and CPD content. Most of the second-round respondents shared that they had prepared their pharmacy by installing transparent plastic shields on their counters (94%), advising staff to wear PPE (87%), and placing marks on the floor to indicate safe distancing (84%). They also reported that they disinfect deliveries before bringing them into the pharmacy (86%) and do not allow couriers to enter the pharmacy (60%). 69% reported that these practices were motivated by content seen on SwipeRx.

To reduce supply chain disruptions during COVID-19 times, pharmacy professionals reported that they prepared a list of substitute products which were hardest to source (80%), kept a list of alternative suppliers (74%), and checked suppliers' inventory periodically (67%). More than half of respondents (62%) reported that these practices were motivated by SwipeRx content. However, no significant differences were detected in the answers to the additional questions based on CPD completion/non-completion

status, possibly influenced by widespread exposure to awareness posts which emphasized the same themes.

Table 4: Additional Questions on Pharmacy COVID-19 Practices

Question	Second Survey Responses (Oct-Nov 2020)
Which of the following safety measures do you practice at your pharmacy? (multiple response possible)	**n = 298**
Place a transparent plastic shield on the pharmacy counter	94%
Place marks on the ground to indicate the appropriate distance between people inside the pharmacy	84%
Advise pharmacy staff to wear personal protective equipment	87%
Not allowing couriers to enter the pharmacy when delivering medicine or other packages	60%
Disinfect deliveries from wholesale distributors before they are taken inside the pharmacy	86%
Others, please specify	5%
Were any of the practices you mentioned in the previous question motivated in part by content you saw on SwipeRx?	**n = 295**
No	31%
Yes	69%
Has your pharmacy taken any of the following actions to help reduce the risk of drug shortages in COVID-19 times? (multiple answers possible)	**n = 295**
Keep a list of alternative suppliers	74%
Check suppliers' inventory periodically	67%
Only dispense essential medicines to clients with a prescription	46%
Prepare substitute products for those that are hardest to source during these times	80%
Reducing quantities of medication that you dispense to any one client	39%
Others, please specify	2%
None of the above	2%
Were any of the actions you mentioned in the previous question motivated in part by content you saw on SwipeRx?	**n = 289**
No	38%
Yes	62%

Discussion

As a consistent source of heath care throughout the pandemic, pharmacies have been reliable and accessible to the community amidst lockdowns and evolving national guidelines. Recognizing their

importance, JHUCCP invested in COVID-19 awareness and education on SwipeRx for pharmacy professionals as they serve on the frontlines of the pandemic. After the first three months of exposure to COVID-19 awareness messaging and one month of access to a COVID-19 CPD, this study was designed to assess changes in knowledge, attitudes, and practices among pharmacy professionals. Analysis of the survey findings reveal the following learnings:

Insight 1: Knowledge about COVID-19 basic information is high among pharmacy professionals, who also acknowledge the role for pharmacies during COVID-19

Among second-round survey respondents, basic knowledge on COVID-19 was high regarding COVID-19 symptoms (94% correct), asymptomatic transmission (93% correct), transmission methods (97% correct), and mask-wearing regardless of whether a person is feeling healthy (97% correct). Survey respondents who had taken the COVID-19 CPD were significantly more likely to acknowledge the role that the pharmacy plays in the pandemic response, compared to those who did not take the CPD. While their levels of knowledge and confidence may have been influenced by other sources of COVID-19 information, the fact that most second survey respondents had completed the CPD (80%) and had seen COVID-19 awareness posters (96%) implies a possible correlation between exposure to SwipeRx content and COVID-19 knowledge and awareness.

Insight 2: Pharmacy professionals attribute SwipeRx as motivating individual as well as pharmacy-safe COVID-19 prevention practices

Most respondents to the second survey reported practicing personal protection measures such as wearing masks, engaging in proper hand sanitization, and cleaning workspaces regularly. Although information on COVID-19 prevention was widely disseminated through mass media during the same time period, 76% of second survey respondents reported that the practices were motivated by SwipeRx content. These findings suggest that pharmacy professionals attribute their COVID-19 practices to exposure to SwipeRx content.

In addition, results from the second survey indicate high reported rates of pharmacy-safe practices including placing barriers on pharmacy counters (94%), putting marks on the pharmacy floor to facilitate physical distancing (84%), disinfecting pharmacy deliveries from suppliers (86%), and preemptively monitoring supplier inventory or making substitute lists to maintain medicine supply (67%-80%). More than 3 out of 5 shared that these practices were motivated by COVID-19 content seen on SwipeRx.

Insight 3: There is scope to further improve COVID-19 knowledge and practices among pharmacy professionals to support pandemic containment in the Philippines

The second survey highlighted specific COVID-19 topics requiring future attention. For example, more than 82% of pharmacy professionals in the second survey reported thinking that clients with mild symptoms who were young with no pre-existing conditions should seek care at the hospital (instead of

advising self-isolation). Future messaging on appropriate recommendations for referrals and self-isolation can enable pharmacy professionals to help health facilities manage the burden received during COVID-19.

Knowledge regarding COVID-19 treatment and the risks associated with dispensing antibiotics to clients with COVID-19 symptoms are also lower than ideal among pharmacy professionals. Further investments in SwipeRx COVID-19 awareness and education content should focus on addressing these and other key gaps outlined earlier in this report. Implementing multiple rounds of education and allotting more time for exposure to CPD and awareness content beyond one to three months, could also facilitate changes in knowledge, attitudes and practices to support COVID-19 containment in the Philippines.

Future efforts to scale access to rapid testing and vaccination for COVID-19 may also be facilitated by additional investments in pharmacy awareness and education. According to these survey results, only 55% of pharmacy professionals were able to correctly answer questions about COVID-19 rapid tests and nearly 1 in 5 thought that rapid tests can be legally sold in pharmacies. Given the volume of pharmacy clients seeking COVID-19 information and care, further efforts to equip pharmacy professionals to provide informed and trustworthy advice on COVID-19 are warranted to support the pandemic response in the Philippines.

Appendix

Appendix Table 1: Provincial Respondent Distribution

What province do you live in?	n	% response
	299	
Metro Manila		24%
Camarines Sur		< 1%
Cavite		4%
Bulacan		6%
Laguna		8%
Pangasinan		3%
Rizal		4%
Batangas		1%
Pampanga		3%
Quezon		8%
Isabela		1%

Tarlac	2%
Cagayan	3%
Palawan	1%
Benguet	3%
La Union	1%
Ilocos Sur	2%
Ilocos Norte	2%
Aurora	< 1%
Kalinga	1%
Ifugao	< 1%
Mountain Province	< 1%
Nueva Ecija	2%
Zambales	1%
Davao del Sur	2%
Zamboanga del Sur	2%
South Cotabato	2%
Cotabato	1%
Davao del Norte	1%
Sulu	< 1%
Compostela Valley	1%
Agusan del Sur	< 1%
Misamis Occidental	< 1%
Cebu	4%
Negros Occidental	1%
Iloilo	2%
Leyte	1%
Negros Oriental	1%
Samar	< 1%
Capiz	1%
Southern Leyte	< 1%

Appendix Table 2: Care-seeking for mild symptoms across CPD education (Chi-Squared Test)

	No CPD ncol (%)	Yes CPD ncol (%)	Total	χ2, p
If a young adult with no pre-existing respiratory conditions is displaying even mild symptoms of COVID-19, such as dry cough, fever, or shortness of breath, they should still seek care at the hospital.				χ2 = 11.58 p = 0.001
Incorrect	41 (67%)	202 (86%)	243	
Correct	20 (33%)	33 (14%)	53	
Total	61	235	296	

Appendix Table 3: Belief of pharmacy role during COVID-19 across CPD education (Mann-Whitney U Test)

	No CPD median (IQR)	Yes CPD median (IQR)	U, p
I believe that pharmacies and pharmacy professionals play an essential role in the response to COVID-19.	4 (4 - 4)	4 (4 - 4)*	U = 6447 p = 0.018

where * means higher mean rank
where 4 = "Strongly Agree""