

COVID-19 Vaccination Acceptance Among Health Care Workers from a Community-based Clinic Chain: A Cross-sectional Study

Patrick Reynard C. Santos, MD; Catherina R. Valencia, MD; Emille May Almeda, MD and Tirso Bernardo II, MD

Background: Since the implementation of the community quarantine by the Philippine government last March 17, 2020 the country has been living in constant fear of possibly contracting the virus. Even as vaccines have been developed and tested, not everyone is confident in having themselves vaccinated against COVID-19. This is true even for healthcare professionals who are at increased risk of exposure to the virus.

Objective: This study aimed to determine the acceptance rate of COVID-19 vaccination among Health Care Workers from a primary care setting during the COVID-19 pandemic.

Methods: A cross-sectional study was conducted from April to June 2021 with 101 healthcare workers from all active clinics of Healthway Family Clinics at the time of the study. The participants were given self-administered questionnaires containing 15 items regarding socio-demographic data as well as willingness to receive and perception of COVID-19 vaccination.

Results: Overall, 97% of the 101 total participants are willing to receive the COVID-19 vaccine once it is made available to them, while 3%, displaying vaccine hesitancy, would like to wait before getting vaccinated. Most participants in the study were female (66.3%) and single (72.3%) with a mean age of 30.82 years. Majority of the participants were doctors (56.4%), followed by nurses (25.7%), clinic assistants (7.9%), pharmacists (7.9%) and radiology technicians (2.1%). There was no significant association between vaccination acceptance with sociodemographic variables and perceptions about the vaccine.

Conclusion and Recommendation: Once the COVID-19 vaccine is available to them, majority of the healthcare workers in the study's primary care community-based clinics will immediately avail of the vaccination and while the remaining displays vaccine hesitancy. This is encouraging because it is important for health workers to protect themselves from the risk of COVID-19 infection by getting immunized as well as be in the forefront of encouraging our patients to have themselves immunized as well. Future researchers may use this study and its recommendations to analyze possible trends and associations with regards to COVID-19 vaccine acceptance and uptake.

Key words: COVID-19 vaccination acceptance, health care workers

INTRODUCTION

COVID-19 is a disease caused by the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) identified from Wuhan, China. The disease is highly contagious and can easily spread from one person to another. Clinical manifestations of SARS-CoV-2 range from asymptomatic to severe acute respiratory syndrome.¹ Due to this, the disease became a global burden which led to the World Health Organization (WHO) to declare COVID-19 as a pandemic. The COVID-19 pandemic is expected to continue to impose enormous burdens of

morbidity and mortality while severely disrupting societies and economies worldwide.²

Since the implementation of the community quarantine by the Philippine government last March 17, 2020 the country has been living in constant fear of possibly contracting the virus. Even before the quarantine, people all over the world have been wanting a way to decrease the risk of contracting the virus. Despite stricter health protocols, the cases of those afflicted by the virus continue to rise as it evolves and mutates to newer forms. To address the world's need for prevention of contracting the virus, various institutions in different

countries raced to develop a vaccine for the virus. Moderna, Oxford-AstraZeneca, and Pfizer are only a few of those institutions that answered the call. Even as vaccines have been developed and tested, not everyone is confident in having themselves vaccinated against COVID-19. This is true even for healthcare professionals who are at increased risk of exposure to the virus.

In the Philippines, there currently is little to no studies done with regards to COVID-19 vaccine acceptance, especially those of healthcare workers. Protective behaviors are key to managing pandemics and vaccination of health professionals is also a way of maintaining full functionality of the healthcare system and protecting the patients during an epidemic or pandemic.³ This study aimed to determine acceptance rate of COVID-19 vaccination in healthcare workers in a primary clinic which is a frontline institution. Information from this study may increase knowledge and aid in future studies on how to improve vaccine acceptance and possible uptake which can lead to improvement in disease prevention.

Significance of the Study

Since the start of the COVID-19 pandemic last March 2020, every Filipino was hoping for a definite solution to prevent the spread of infection, however when news from the World Health Organization and other health agencies publicized the production and inoculation of the COVID-19 vaccine, a lot of Filipinos had mixed opinions on the safety of the vaccine for human use. The findings of this study can help determine the acceptance and uptake of COVID-19 vaccination among Healthcare Workers. It will also help in determining the possible associated factors contributing to acceptance, hence the data can be used by healthcare providers in formulating health strategies to bridge any gap of misinformation and hesitancy among Filipinos and it would also help the health sector of our government to implement health programs to improve the understanding of each Filipino regarding the use of vaccines to prevent diseases. These can aid in future studies and formation of programs to increase vaccination uptake.

Conceptual Framework

Identifying and understanding the interplay of sociodemographic profiles and perceptions of Healthcare Workers in the acceptance of COVID-19 vaccination during the pandemic for the basis of future health programs and services.

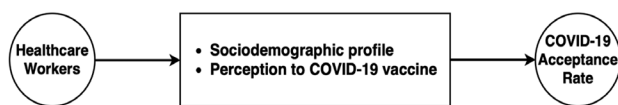


Figure 1. Conceptual Framework

Objectives

General Objectives

This study aimed to determine the acceptance rate of COVID-19 vaccination among Health Care Workers from a primary care setting during the COVID-19 pandemic.

Specific Objectives

- To determine the respondents' sociodemographic characteristics with respect, but not limited, to age, sex, civil status, designation (Medical or Allied Healthcare Practitioner), and tenure.
- To determine the perception of Healthcare Practitioners regarding COVID-19 vaccination.
- To determine respondents' willingness to be vaccinated with COVID-19 vaccination.
- To determine factors associated with willingness to be vaccinated.

METHODS

Study Design and Setting

This study was conducted using an analytical cross-sectional design among health workers of primary care clinics. These clinics are part of Heathway Family Clinics, formerly operating as FamilyDOC, a privately-owned chain of primary care clinics with services such as consultation, diagnostics and pharmacy.

Study Population

Study participants included all clinic resident and retainer physicians as well as allied health care workers who are currently employed under the chain of primary care clinics, and assigned to all operating Heathway Family Clinics during the study duration. Allied health care workers included nurses, pharmacists, radiology technicians, and clinic assistants.

Inclusion Criteria

- All residents and retainer physicians, nurses, clinic assistants, pharmacists and radiology technicians presently practicing in the health care facility during the duration of this study.

Exclusion Criteria

- Those who refuse to participate
- Specialists practicing in the Heathway Family Clinics
- Workers in the clinic who are employed under a third-party agency
- Those who have any allergy to existing vaccines and their components

Sample and Sampling Technique

Non-probability sampling, specifically the convenience sampling method, was employed for all clinics; this included all residents and retainer physicians, nurses, clinic assistants, pharmacists and radiology technicians practicing in the health care facility. We received a total of 101 (84%) responses from the expected 120 invites sent to health care workers.

Research Instrument

A self-administered questionnaire was used to collect data from the respondents of the study. The questionnaire contains 15 items which asked about demographic data, history of receiving previous vaccinations, perceived susceptibility to COVID-19, fear related to vaccinations and the perception of possible risks of COVID-19 vaccination. Pilot testing was conducted by sending a google form link containing the 15-item questionnaire to the personal email addresses of 5 health care workers who were former employees of the company. After which, it was analyzed if sufficient data can be extracted from it. Evaluations of the pilot testing were consulted with research consultants, then the questionnaire had been finalized.

Ethical Considerations

Prior to the start of the research, it was presented before a panel of consultants. After undergoing revisions to address issues and concerns of the panel, the study was approved. Before data collection commenced, the researchers sent the informed consents to be signed by the participants to their personal emails, clearly stating that there are no expected risks, interventions, nor benefits that will be involved. The researchers made sure to be available for any questions or clarifications about the study details and informed consent. Participants were also given the option to decline at any point during the survey. Participants were assured that confidentiality would be maintained, and that there were no conflicts of interest. Data gathered was handled with confidentiality, password-protected, was only accessible to the researchers and statistician, and was not used for any other reason outside the scope of this study. Electronic data were stored in a secure computer and the data will be stored for 3 years after the conclusion of the research then subsequently deleted. Each participant was assigned a code number to ensure anonymity.

Statistical Analysis

To analyze the results Excel Software and Google Sheets was utilized for data encoding, processing, and analytics. Descriptive statistics (frequencies and percentages) was used to analyze the responses. Chi Square Test of Independence was used to test for association of categorical variables, and t-test for continuous variables. Fisher exact test was used if Chi square test was not applicable, when categories of certain variables had frequencies of less than 5.

Results

Participant Characteristics

We received a total of 101 (84%) responses from the expected 120 invites sent to health care workers. During the time of the study, adjustments were done to account for drop-outs due to resignation from the company. From the 155 individuals who were sent invites, 120 remained employed in the company until the end of the research period resulting in an 84% participation rate. The baseline characteristics

of the remaining study participants are presented in Table 1. Most participants in the study were female (66.3%) and single (72.3%) with a mean age of 30.82 years. Majority of the participants were doctors (56.4%), followed by nurses (25.7%), clinic assistants (7.9%), pharmacists (7.9%) and radiology technicians (2.1%).

Most of the participants have been employed in the company for 6 months or more (96%) with a personal monthly income of >20,000 pesos (62.4%). Majority of the participants also do not have comorbid conditions (80.2%) but among those who have (19.8%), most of them have Hypertension (3%) and Asthma (3%). Most of the participants also do not live with family members aged 65 years old and older (67.3%).

Acceptability of COVID-19 Vaccination

Overall, 97% of the participants are willing to receive the COVID-19 vaccine once it is made available to them while 3% of them show vaccine hesitancy and would like to wait before getting vaccinated.

A number of participants (81.2%) report not having any fear of needles and more than half of the participants (57.4%) stated that they have been vaccinated against Influenza in the year 2020. Overall, the majority of the participants (98%) believe that they are at risk of being infected with COVID-19. Of those who have indicated fears for possible adverse effects of the COVID-19 vaccination (26.7%), the majority indicated fear of allergic reactions and other side-effects of the vaccine such as fever and body pain.

Vaccine Willingness and its Association to Other Variables

Table 2 shows the profile of patients with regards to vaccine willingness. Those who exhibit unwillingness to be vaccinated had a mean age of 34.33 years, are female (2, 1.98%), a non-physician by profession (2, 1.98%), with a monthly personal income of 10,000-20,000 (2, 1.98%), with no comorbidities (2, 1.98%), not living with an elderly individual (2, 1.98%), did not have influenza immunization in the year 2020 (2, 1.98%), is not afraid of vaccine adverse effects (2, 1.98%) and has no fear of needles (2, 1.98%). All of those who exhibit unwillingness to be vaccinated are single (3, 2.97%), with a tenure of 6 months or more (3, 2.97%), with a perception that they are susceptible to acquiring the COVID-19 infection (3, 2.97%).

The proponents sought to find associations between COVID-19 vaccination willingness and the variables we asked of the participants in the questionnaire. We can see that the results of the tests of association in Table 2 are more than the p-value of 0.05 (95% CI). With this, we can say that there is no significant association between willingness to be vaccinated and the variables of age, sex, civil status, occupation, tenure, monthly personal income, comorbidities, living with elderly, influenza vaccination, perceived COVID-19 vaccination, fear of needles and adverse effects of vaccination.

DISCUSSION

A study by Bish and Michie identified protective behaviors observed during the H1N1 Influenza pandemic.³ These were broadly classified into three types: preventive, avoidant, and management of

Table 1. Demographic characteristics of the study population grouped by age, sex, civil status, occupation, tenure, personal monthly income, comorbidities, living with the elderly, previous influenza vaccination, perceived susceptibility to COVID-19 as well as the fear of needles and vaccine adverse effects.

Demographic Characteristics	n	%
Age		
18-30 years	54	53.5
31-40 years	46	45.5
41-50 years	1	1
51-60 years	0	0
Sex		
Male	33	32.7
Female	66	37.2
Civil Status		
Single	73	72.3
Married	26	25.7
Widow	1	1
Separated	1	1
Occupation		
Physician	57	56.4
Nurse	26	25.7
Clinic Assistant	8	7.9
Pharmacist	8	7.9
Radiology Technician	2	2.1
Tenure		
Less than 6 months	4	4
6 months or more	97	96
Monthly Personal Income		
<10,000	2	2
10,000-20,000	36	35.6
>20,000	63	62.4
Comorbidities		
Yes	20	19.8
No	81	80.2
Living with Elderly		
Yes	33	32.7
No	68	67.3
Influenza Vaccine on year 2020		
Yes	58	57.4
No	42	41.6
Not sure	1	2
Susceptible to COVID-19		
Yes	99	98
No	1	1
Not sure	1	1
Willing to be Vaccinated		
Yes	98	97
No	0	0
Yes, but want to wait	3	3
Fear of Needles		
Yes	17	16.8
No	82	81.2
Not sure	2	2
Fear of Vaccine Adverse Effects		
Yes	27	26.7
No	68	67.3
Not sure	6	5.9

disease behaviors. Preventive behaviors include hygiene behaviors (such as hand washing, coughing or sneezing into a hand or tissue, cleaning surfaces); mask wearing and uptake of vaccinations. Avoidant behaviors include avoiding crowds, public transport, and work and compliance with quarantine restrictions. Management of disease behaviors include taking antiviral medication, seeking help from a professional and use of telephone or Internet help lines. These protective behaviors can be applied to the current pandemic and are important in decreasing and eventually halting the spread of COVID-19.

Uptake of vaccinations is one of the preventive protective behaviors. For years, vaccines have been used for disease control. Even during outbreaks, the use of vaccines has shown a decrease in disease spread. A study by Musa, et al. on the effectiveness of the measles vaccine in the outbreak in the Federation of Bosnia and Herzegovina in the years 2014-2015 showed that one dose reduced the risk for measles by 91.9% (95% CI: 81.4-96.4%), two doses reduced the risk by 97.3% (95% CI: 95.5-98.4%).⁴ Vaccines have also led to disease eradication such as Smallpox allowing discontinuation of routine smallpox immunization globally.⁵ Protective behaviors are key to managing pandemics, and vaccination could be a key protective behavior for COVID-19.⁶ The Philippines has among the highest COVID-19 infection rates in the region, interlaced in economic and political ramifications.⁷

In the current study, the majority (98%) of the healthcare professionals in the community-based clinic chain believe that they are at risk of getting the COVID-19 infection and that most (97%) of them are willing to be immunized once the vaccine is available to them. This result is similar to a study by Al-Metwali, et al. where the majority of the participants were health workers with most of them willing to be vaccinated and also believe they are at risk of getting the COVID-19 infection.⁸ This may also be evidence of the finding in the study of Harapan, et al. stating that since healthcare workers have more comprehensive knowledge about COVID-19, their relatively high awareness may lead them to protect themselves and not to transmit the virus to their family members.⁹

In the aftermath of the Dengvaxia controversy, confidence in vaccines and/or the national immunization program in the country plummeted.¹⁰ This contributes to the rise in vaccine hesitancy, defined by the World Health Organization (2015) as a 'delay in acceptance or refusal of vaccination despite availability of vaccination services'.² Vaccination hesitancy is an imminent threat in the battle against COVID-19 because achieving herd immunity depends on the efficacy of the vaccine itself and the population's willingness to accept it.¹¹ Our findings demonstrate that most of the participants of the study are willing to be vaccinated with COVID-19 vaccine. Though a portion (3%) of the participants displays vaccine hesitancy, wanting to wait before receiving the vaccine. This existence of COVID-19 vaccine hesitancy among healthcare workers is consistent with that of the other studies involving healthcare workers in the systematic review of COVID-19 vaccine acceptance rates by Sallam, as the acceptance rates of those studies ranged from 27.7-78.1%.¹² A study by Maraqa, et al. has observed that nurses and females were the most hesitant regarding vaccines, while physicians and males were the most supportive, which was also evidenced in this study.¹³ Gagneux-Brunon, et al. found in their study that association between occupation and intention to get

Table 2. Willingness to be vaccinated by the study population and association to the variables of age, sex, civil status, occupation, tenure, personal monthly income, comorbidities, living with the elderly, previous influenza vaccination, perceived susceptibility to COVID-19 as well as the Fear of needles and vaccine adverse effects.

Willing to be Vaccinated	Yes	No	T-test	
			t-value	p-value
Age (years)	30.71±3.64	34.33±3.78	1.69	0.0941
<i>Note: data presented above as mean ± standard deviation</i>				
			Chi-square	Fisher
Sex			0.9902	1.000
Male	32 31.68%	1 0.99%		
Female	66 65.35%	2 1.98%		
Civil Status			0.2881	0.5623
Single	71 70.29%	3 2.97%		
Married	27 26.73%			
Occupation			0.4126	0.5786
Physician	56 55.44%	1 0.99%		
Non-Physician	42 41.58%	2 1.98%		
Tenure			0.721	1.000
Less than 6 months	4 3.96%			
6 months or more	96 95.05%	3 2.97%		
Monthly Personal Income			0.2547	0.2885
<10,000 or >20,000	64 63.36%	1 0.99%		
10,000-20,000	33 32.67%	2 1.98%		
Comorbidities			0.03865	0.0991
Yes	19 18.81%	1 0.99%		
No	79 17.82%	2 1.98%		
Living with Elderly			0.9802	1.000
Yes	80 79.21%	1 0.99%		
No	18 17.82%	2 1.98%		
Influenza Vaccine on year 2020			0.3915	0.5734
Yes	57 56.44%	1 0.99%		
No	41 40.59%	2 1.98%		
Susceptible to COVID-19			0.8026	1.000
Yes	96 95.05%	3 2.97%		
No	2 1.98%			
Fear of Needles			0.438	0.4282
Yes	16 15.84%	1 0.99%		
No	82 81.18%	2 1.98%		
Fear of Vaccine Adverse Effects			0.7931	1.000
Yes	26 25.74%	1 0.99%		
No	72 71.28%	2 1.98%		

vaccinated against COVID-19 was independent of age, gender, vaccine hesitancy, and self-perceived risk for COVID-19 infection.¹⁴

Healthcare professionals play an important role in influencing patients with their health choices. A study of Danchin, et al. anticipates that primary care physicians and allied practitioners will be at the forefront of COVID-19 vaccine delivery as well as potentially one of the initial target groups for COVID-19 vaccine receipt.¹⁵ In a study by Reiter, Pennell and Katz, strong correlation between vaccine acceptability of patients to that of health care provider recommendation was found.⁶ Healthcare professionals who have an unfavorable attitude, aversion or hesitation towards vaccinations, transmit these hostile attitudes to vaccinations to patients, and tend to recommend vaccination less frequently.¹⁶ With healthcare workers being key promoters to prevent further spread, morbidity and mortality from COVID-19, it is important to examine acceptability of COVID-19 vaccines by primary care personnel.

Limitations

One limitation of this study is that differences in opinion with regards to vaccine brands were not explored. In recent days, Filipinos have expressed the desire to be vaccinated but only with specific vaccine brands. This may be an important association and contributor to achieving herd immunity hence may be an important point to be studied.

CONCLUSION AND RECOMMENDATION

Once the COVID-19 vaccine is available to them, majority of the healthcare workers in the study's primary care community-based clinics will immediately avail of the vaccination. No significant associations were found between willingness to be given COVID-19 vaccination and the variables of age, sex, civil status, occupation, tenure, monthly personal income, comorbidities, living with the elderly, influenza vaccination, perceived susceptibility to COVID-19, fear of needles and fear of vaccine adverse effects. As primary care health practitioners at the frontlines facing the patients with their initial symptoms and presentations, it is important they be protected from the risk of COVID-19 infection by getting immunized as well as be in the forefront of encouraging patients to have themselves immunized.

This study recommends that possible queries and concerns, from those who are having vaccine hesitancy or trouble deciding whether to get vaccinated or not, be addressed by health authorities. Leaving such things to social media and the news may contribute to the confusion and vaccine hesitancy displayed by healthcare workers and patients alike. As a company of healthcare professionals, it is imperative to aid our employees and patients in decision-making regarding vaccination and other health concerns. Another recommendation is the investigation of factors that discourage or cause hesitancy from receiving COVID-19 vaccination and correspondingly design an appropriate intervention. Future researchers may use this study and its recommendations to analyze possible trends and associations with regards to COVID-19 vaccine acceptance and uptake. Beyond from healthcare workers in a private company, the study may be broadened to include the general population. Possible factors and trends with regards to COVID-19 vaccine acceptance are important topics of study and can be applied in

the development of policies, programs and strategies to accelerate the country's herd immunity.

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