

## RESEARCH ARTICLE

# COVID-19 vaccination perception and attitude among Filipino mothers in Lucena, Quezon Province

Krichelle M. Domingo\*, Czyrille Joy E. Del Rosario, Jennilyn Queenie N. Dela Cerna, Jasmine T. Diaz, Yaddah Shalom R. Dollente, Peter Thomas O. Eborra, and Vivian G. Villegas

\*Corresponding author's email address: krichellematiasdomingo@gmail.com

Department of Medical Technology, Faculty of Pharmacy, University of Santo Tomas, Manila, Philippines

### ABSTRACT

**Background:** Ever since the Dengvaxia controversy, vaccine confidence has plummeted in the Philippines, posing a problem for the COVID-19 vaccination program in the country [1,2]. With the impending COVID-19 pandemic, it is crucial to identify those who refuse vaccination, their perception about vaccines, and the immensity of their concerns [3].

**Objectives:** This study aimed to measure and describe the perception and attitude of Filipino mothers regarding COVID-19 vaccination for themselves and their children.

**Methodology:** This descriptive-correlational study had a total of 404 respondents who answered the adapted survey questionnaire. The data gathered were analyzed through descriptive statistics such as percentages and standard deviations, and correlated using T-test and Pearson product-moment correlation.

**Results:** The majority of the respondents stated their reluctance to receive the COVID-19 vaccine for themselves (56.9%) and their children (55%) while more than a third stated their refusal of the said vaccine for themselves (35%) and their children (39.6%). The top reason for their refusal was the concern for potential side effects. An overwhelming proportion of the respondents perceived that local leaders would support COVID-19 vaccination. Moreover, those who heard negative feedback on vaccines still stated their willingness to accept it. The respondents generally had a positive attitude on COVID-19 vaccination in terms of its importance. Pearson correlation showed a high positive correlation ( $r=0.785$ ,  $p<0.05$ ) between attitude towards self- and child-vaccination.

**Conclusion:** Respondents had a general positive attitude towards COVID-19 vaccination. Respondents with a more positive attitude towards self-vaccination were likely to have a positive attitude towards child-vaccination for COVID-19.

**Keywords:** vaccines; COVID-19; vaccination perception; vaccination attitude; Filipino mothers; self-vaccination; child vaccination

## Introduction

Vaccine confidence plummeted in the Philippines due to the Dengvaxia vaccine controversy in 2017 [1]. A year after the said controversy, a significant increase in localized measles cases across the Philippines was observed. In February 2019, the Department of Health (DOH) announced a measles outbreak and attributed it to the dramatic increase in vaccine hesitancy [4]. During the same year, DOH confirmed a polio (vaccine-derived poliovirus, VDPV) re-emergence in the Philippines. As a result, it announced a polio outbreak of national concern in September 2019 [5].

After the polio outbreak, the Philippines was again faced with another problem when the World Health Organization declared the COVID-19 pandemic on March 11, 2020 [6].

A recent study conducted by Corpuz [2] mentioned that the apparent vaccine hesitancy and distrust of Filipinos during the past few years would be a huge barrier to the implementation of COVID-19 vaccination programs in the country. According to an article written by Marti *et al.* [7], the most frequently cited reasons for hesitancy to vaccines are related to the understanding of the collective risks and

benefits of vaccines, knowledge and awareness issues of the public, and cultural, religious, and/or socioeconomic factors. The general reasons for hesitancy to vaccines are fear of vaccine side-effects, distrust in the healthcare system, lack of education, misinformation, and an overall distrust in vaccination.

A study conducted by Romer and Jamieson [8] in the United States concluded that conspiracy theories and mistaken fears related to the nature and effects of vaccination could be predictors of resistance to vaccination and preventive action. They stated that these factors were considered barriers that should be reduced to reinforce preventive behavior and willingness to be vaccinated. A study among Malaysians done by Syed Alwi *et al.* [9], found that the leading causes of vaccine hesitancy were fear of the side effects, growing concern about the safety of the vaccines, lack of information, and questionable effectiveness of the said vaccines. Furthermore, among healthcare workers in Indonesia, 93.3% would decide to get vaccinated if the vaccine had 95% effectiveness, while only 67% would agree to be vaccinated if the vaccine had only 50% effectiveness [10].

According to Henrikson *et al.* [11], vaccine-hesitant parents should be regarded as an important focus when conducting vaccine hesitancy surveillance. Jung [12] also highlighted the need to further elucidate the possible effects of maternal decisions on vaccinations in the East Asian region. In addition, the Centers for Disease Control and Prevention [13] recently approved the BNT162b2 (Pfizer- BioNTech) to be administered to children aged 12 to 15 years old. The CDC currently recommends that the said age group get vaccinated for COVID-19; Lovelace [14] also reported that mRNA-1273 (Moderna) already confirmed expanding its COVID-19 vaccine clinical trial testing to children aged 5 to 11 years old.

To aid in the assessment of COVID-19 vaccine acceptance in specific areas of the Philippines during the COVID-19 pandemic, this study aimed to describe and measure the perceptions and attitudes of Filipino mothers in Lucena, Quezon Province regarding COVID-19 vaccination for themselves and their children. It specifically aimed to determine the demographic profile of the study participants and describe how mothers perceive COVID-19 vaccination as influenced by certain authorities and feedback heard. It also aimed to describe the level of attitude of the respondents about self-vaccination and child-vaccination for COVID-19, and determine the relationship between the

said vaccinations. The information provided in this study would serve as reference for future studies that would focus on assessing COVID-19 vaccine acceptance in Filipino mothers concerning child vaccination. As previously mentioned, COVID-19 vaccines for children younger than 12 years old are currently underway, which further strengthens the relevance of this study. The findings of this study would also be particularly beneficial to public health institutions in Quezon Province implementing COVID-19 vaccination programs.

## Methodology

### *Study Design and Participants*

This descriptive-correlational study collected data through a web-based survey conducted on Filipino mothers residing in Lucena City, Quezon Province during the month of April 2021. The area was selected because of the capital city's highly increasing COVID-19 cases for the duration of the study, and its accessibility to the researchers. Participants were recruited using purposive sampling with the following criteria: a Filipino mother aged 18-55 years old residing in Lucena, Quezon Province, has at least one child, has access to Facebook, and willing to answer the online survey. The questionnaire was designed using the Google Forms platform, and it was electronically distributed through the Facebook accounts of the researchers. Before answering the survey questionnaire, the participants were presented with a clause that indicated the inclusion criteria, and a consent form to confirm their willingness to participate in the research. Those who fit these criteria and agreed to the consent form were allowed to answer the questionnaire.

### *Survey Tool*

The survey was provided to the participants in two languages: Filipino and English. The questionnaire was adapted from the vaccine hesitancy survey tool by the World Health Organization (WHO) Strategic Advisory Group of Experts (SAGE) Working Group on Vaccine Hesitancy. It also utilized the COVID-19 questionnaire developed by the UST-CoVAX Awareness Team in its study "UST-CoVAX Survey: Filipinos Have Significant Worries about the COVID-19 Vaccines". The questionnaire was assessed by a registered psychometrician on its face and content validity and was subjected to an inter-rater agreement by three validators with a Master's degree in Public Health. In addition, the questionnaire underwent pilot testing, and Cronbach's alpha

assessed the Likert scale questions to check its internal consistency and reliability. A total of 35 respondents, particularly mothers aged 18-55 years old, participated in the pilot test, and the scale obtained a Cronbach's alpha value of 0.845. This value falls within under the acceptable range of 0.70 to 0.95 (Tavakol & Dennick, 2011), which means that the Likert Scale questions of the questionnaire had a high level of reliability and internal consistency.

The questionnaire consisted of dichotomous questions in the form of "Yes or No," accompanied by open-ended follow-up questions to gain insight into the opinions of the participants. The study also included a five-point Likert scale in determining the level of attitude.

The questionnaire covered demographic information - age, educational attainment, employment status, marital status, number of children, and corresponding age range of their children. It also covered perceptions and attitudes towards self- and child- vaccinations for COVID-19. Questions directed towards perception (9 questions) asked about their decision to receive the COVID-19 vaccine; the type of feedback they encountered about the vaccine; and their perception of the support given by religious leaders, politicians, teachers, and healthcare workers to COVID-19 vaccination. Those who stated their hesitancy and refusal to receive COVID-19 vaccination for themselves and their children were asked about their reasons for doing so.

For describing the attitude level towards self- and child-vaccination, responses were recorded on a five-point rating scale (Strongly Agree, Agree, Neutral, Disagree, or Strongly Disagree), which indicated the respondents' degree of agreement or non-agreement on 10 statements about the importance and safety of the available COVID-19 vaccines and potential COVID-19 vaccine for children. The first seven scale statements about the importance of the COVID-19 vaccines and concern for their side effects were adapted from the WHO-SAGE survey tool, and the last three statements about the safety of the COVID-19 vaccines from China, US/Europe, and Russia were adapted from the UST-CoVAX Awareness Team questionnaire.

### *Statistical Methods*

Categorical variables were described in frequency counts and percentages, while numerical variables were described in means and standard deviations. The responses of the participants to the dichotomous questions pertaining to their perception of the COVID-19 vaccines were also analyzed using

a t-test to check for the significant difference. For the level of attitude of the respondents towards self- and child-vaccination for COVID-19, data obtained from the Likert scale were analyzed using the absolute approach rating, and for the determination of the relationship between the level of attitude of the respondents in terms of the said COVID-19 vaccinations, the Pearson product-moment correlation was used.

### *Ethical Considerations*

This study was approved by the Research and Ethics Committee of the University of Santo Tomas - Faculty of Pharmacy (Study protocol code: FOP-ERC-2021-01-063). Participation was entirely voluntary, and an electronic informed consent was acquired from all participants through a required question at the beginning of the survey after providing a thorough explanation of the study's objectives, procedure and benefits, and the confidentiality voluntariness of participation. The data acquired from the respondents were treated as strictly confidential and were used only for the purpose of data analysis for this study. The accounts used in accessing the data were all institution-based and restricted to the researchers and statisticians.

## **Results**

### *Demographics*

Table 1 shows the sociodemographic profile of the participants. Among the participants, 51.73% were 40 to 55 years old, 41.09% were 24 to 39 years old, and 7.18% were 18 to 23 years old. Based on their educational attainment, most had a Bachelor's Degree (48.51%), 11.63% had a high school diploma, and 23.27% did not finish schooling. Others obtained a senior high school diploma (5.20%), associate degree (6.68%), and postgraduate degree (4.70%). The majority of the respondents were self-employed (35.89%) and employed (33.42%), while 28.96% were unemployed and 1.73% were already retired. The age of the children ranged from 1 to 3 years old, with most of them who were school-aged (41.58%), adolescents (39.11%), adults (28.71%), and preschoolers (23.27%).

### *Perception of Mothers towards Self- and Child-Vaccination for COVID-19*

As shown in Table 2, out of 404 respondents, 230 (56.9%) stated their reluctance to receive the COVID-19 vaccine, while 174 (43.1%) stated that they were not reluctant. One hundred forty-four (35%) respondents

**Table 1. Demographic Characteristics of Mothers in Lucena City, Quezon Province**

Demographics	Frequency	Percentage (%)
<b>Age</b>		
18 - 23	29	7.18
24 - 39	166	41.09
40 - 55	209	51.73
<b>Degree</b>		
Did Not Finish Schooling	94	23.27
Elementary	0	0.00
High School	47	11.63
Senior High School	21	5.20
Associate Degree	27	6.68
Bachelor's Degree	196	48.51
Post-Graduate Degree	19	4.70
<b>Employment Status</b>		
Unemployed	117	28.96
Self-employed	145	35.89
Employed	135	33.42
Retired	7	1.73
<b>Number of Children</b>		
1	125	30.94
2	116	28.71
3	92	22.77
4	37	9.16
5	22	5.45
6	4	0.99
7	3	0.74
8	1	0.25
9	3	0.74
10	1	0.25
<b>Child Group</b>		
Newborn	8	1.98
Infant	33	8.17
Toddle	65	16.09
Preschooler	94	23.27
School-aged	168	41.58
Adolescent	158	39.11
Adult	116	28.71

indicated that they would refuse the said vaccination for themselves because they perceived the vaccine as unsafe and were concerned about its side effects (101, 25.0%). Hearing negative news about the vaccine was also one of their top reasons for the refusal (63, 15.6%), followed by receiving negative feedback from people who experienced bad side effects (62, 15.3%), and lack of knowledge on where to get reliable information about the vaccine (55, 13.6%). Some would refuse because they perceived the vaccine to be unnecessary (35, 8.7%) and were unaware of where they could get vaccinated for COVID-19 (30, 7.4%). A small portion of the respondents perceived the vaccine to be ineffective (26, 6.2%), while 14 (3.5%) stated they would refuse it

because they feared needles. In addition, some of the participants specified their reasons under 'Others' (36, 8.9%). One respondent stated that she would refuse because she preferred a specific manufacturer, while another stated that she would refuse because she was currently breastfeeding her child. Moreover, the respondents believed that local leaders in their community would find the vaccine acceptable. An overwhelming proportion of the participants perceived healthcare workers (358, 88.6%), politicians (349, 86.4%), teachers (323, 80%), and religious leaders (300, 74.3%) to be supportive and accepting of the COVID-19 vaccine. In terms of feedback received by the respondents, 178 (44.1%) heard positive feedback about vaccination such

**Table 2.** Perception of Mothers towards Self- and Child-vaccination for COVID-19

Questions regarding Perception	Total n(%)	Yes n(%)	No n(%)	P-value*
Q1: Are you reluctant or hesitant to get a COVID-19 vaccination for yourself?	404 (100%)	230 (56.9%)	174 (43.1%)	<.001
Q2: Will you refuse being vaccinated with COVID-19 vaccine?	404 (100%)	144 (35%)	260 (64.4%)	<.001
Q2.1: Fear of needles	404 (100%)	14 (3.5%)	390 (96.5%)	<.001
Q2.2: Heard or read negative news about COVID-19 vaccines	404 (100%)	63 (15.6%)	341 (84.4%)	<.001
Q2.3: I do not know where to get COVID-19 vaccination	404 (100%)	30 (7.4%)	374 (92.6%)	<.001
Q2.4: I do not think that COVID-19 vaccine is needed	404 (100%)	35 (8.7%)	369 (91.3%)	<.001
Q2.5: I do not think that the COVID-19 vaccine is safe, and I am concerned about its side effects	404 (100%)	101 (25.0%)	303 (75%)	<.001
Q2.6: I do not know where to get good/reliable information about COVID-19 vaccines	404 (100%)	55 (13.6%)	349 (86.4%)	<.001
Q2.7: I do not think that the COVID-19 vaccine is effective	404 (100%)	26 (6.4%)	378 (93.6%)	<.001
Q2.8: Someone else told me they experienced bad side effects with the COVID-19 vaccine	404 (100%)	62 (15.3%)	342 (84.7%)	<.001
Q2.9: Other reasons	404 (100%)	36 (8.9%)	368 (91.1%)	<.001
Q3: Do you think that religious leaders in your community support the available COVID-19 vaccines?	404 (100%)	300 (74.3%)	104(25.7%)	<.001
Q4: Do you think that politicians in your community support the available COVID-19 vaccines?	404 (100%)	349 (86.4%)	55 (13.6%)	<.001
Q5: Do you think that teachers in your community support the available COVID-19 vaccines?	404 (100%)	323 (80%)	81 (20%)	<.001
Q6: Do you think that healthcare workers in your community support the available COVID-19 vaccines?	404 (100%)	358 (88.6%)	46 (11.4%)	<.001
Q7: Have you ever received or heard positive feedback about vaccination, especially for the available COVID-19 vaccines?	404 (100%)	178 (44.1%)	226 (55.9%)	<.001
Q8: Have you ever received or heard negative feedback about vaccination, especially for the available COVID-19 vaccines?	404 (100%)	242 (59.9%)	162 (40.1%)	<.001
Q9: If "yes" in the previous question, would you still get yourself vaccinated after hearing or receiving the negative information?	404 (100%)	141 (34.9%)	263 (41.7%)	<.001
Q10: Are you informed that scientists are now working on a COVID-19 vaccine for children below 16 years old?	404 (100%)	171 (42.3%)	233 (57.7%)	<.001
Q11: Are you reluctant or hesitant to get your child vaccinated with the potential COVID-19 vaccine for children?	404 (100%)	222 (55%)	182 (45%)	<.001
Q12: If the potential COVID-19 vaccine for children below 16 years old gets approved, will you refuse getting your child vaccinated?	404 (100%)	160 (39.6%)	244 (60.4%)	<.001
Q12.1: I do not think that the potential COVID-19 vaccine for children will be safe and I am concerned about its side effects	404 (100%)	115 (28.5%)	289 (71.5%)	<.001
Q12.2: I do not think that the potential COVID-19 vaccine for children is needed	404 (100%)	41 (10.1%)	363 (89.9%)	<.001
Q12.3: I do not think that the potential COVID-19 vaccine for children will be effective	404 (100%)	33 ( 8.2%)	371 (91.8%)	<.001
Q12.4: Other reasons	404 (100%)	8 (2%)	396 (98%)	<.001

\*P-value is considered significant if &lt;.05

**Table 3.** *Level of Attitude regarding Self- and Child-vaccination for COVID-19*

	Strongly Agree n(%)	Agree n(%)	Neutral n(%)	Disagree n(%)	Strongly Disagree n(%)	Total n(%)
Self-vaccination	33 (8.2%)	190 (47.0%)	141 (34.9%)	34 (8.4%)	6 (1.5%)	404 (100%)
Child-vaccination	41 (10.1%)	184 (45.5%)	138 (34.2%)	33 (8.2%)	8 (2.0%)	404 (100%)

as the following: (1) protects them from the virus; (2) lowers the risk of them acquiring COVID-19; (3) causes no severe side effects aside from those usually present when vaccinated (e.g., fever, localized pain); (4) helps reduce mortality rate; (5) will be effective against the newly found variants; (6) makes them feel assured, especially those who work in the hospital; and (7) if one acquires the virus, the complications would not be as critical as compared to when one is unvaccinated. Meanwhile, 242 (59.9%) respondents had received negative feedback which stated that the COVID-19 vaccines: (1) brought severe side effects (e.g., Bell's palsy, blood clots); (2) caused allergic reactions; (3) did not produce protection against the virus because some who got vaccinated still harbored the disease; (4) were distributed/administered late to the public; and (5) were ineffective because some say that it was just a "trial" and they did not feel anything after getting vaccinated. Out of 242 respondents who received negative feedback, 141 (58.26%) stated they were still willing to be vaccinated with the available COVID-19 vaccines. In terms of COVID-19 vaccination for children, the majority of the respondents were unaware that vaccines are currently being developed for children (233, 57.7%), while 171 respondents (42.3%) claimed they were informed about this. A total of 222 (55%) respondents expressed reluctance to allow COVID-19 vaccination for their children, while 182 (45%) expressed non-reluctance. Out of the 404 respondents, 160 (39.6%) stated that they would refuse to let their children be vaccinated, while 244 (60.4%) stated that they would not refuse. A third of the respondents expressed refusal to vaccinate their children against COVID-19 as they perceived

the vaccine to be unsafe and were concerned about the side effects (289, 71.5%). Following this, most of the participants considered the COVID-19 vaccine for children unnecessary (363, 89.9%) and believed that it would not be effective (371/404, 91.8%). Moreover, some respondents (8, 2%) specified other reasons, such as children would still be restricted from going outside despite being fully vaccinated.

*Level of Attitude regarding Self- and Child-vaccination for COVID-19*

Table 3 shows the level of attitude regarding self- and child-vaccination for COVID-19. The participants showed a high level of agreement on the importance of self-vaccination for COVID-19, as 47% of the participants agreed on the statements, and 8.2% strongly agreed. A total of 141 (34.9%) respondents were neutral, while 8.4% and 1.5% disagreed and strongly disagreed on the statements, respectively. Regarding child vaccination for COVID-19, a high level of agreement was also noted, with 45.5% of the participants agreeing on the importance of COVID-19 vaccination for children and 10.1% strongly agreeing. The level of neutrality was 34.2%, while a low level of disagreement was noted, with 8.2% disagreeing and 2% strongly disagreeing on the statements regarding child vaccination

*Relationship between Attitude towards Self- and Child-vaccination for COVID-19*

Table 4 shows the relationship between attitude towards self- and child-vaccination for COVID-19. Pearson's correlation

**Table 4.** *Relationship between Attitude towards Self- and Child-vaccination for COVID-19*

		Attitude towards Self- vaccination for COVID-19	Attitude towards Child- vaccination for COVID-19
Attitude towards Self- vaccination for COVID-19	Pearson Correlation Sig (2-tailed) N	1  404	.785** .000 404
Attitude towards Child- vaccination for COVID-19	Pearson Correlation Sig (2-tailed) N	.785** .000 404	1  404

\*\*Correlation is significant at the 0.01 level (2-tailed)

showed that the relationship between attitude towards self- and child-vaccination for COVID-19 had a high positive correlation ( $r=0.785$ ). Mothers with a more positive attitude towards self-vaccination were likely to have a positive attitude towards COVID-19 vaccination for their children.

## Discussion

To promote immunization against COVID-19, it is necessary to understand the general public's perspective about COVID-19 vaccines. This study determined the perception and attitude of mothers regarding self- and child-vaccination against COVID-19 and the numerous factors that influence their viewpoints. The mothers' perception of the adapted last three statements about the safety of the COVID-19 vaccines from China, US/Europe, and Russia COVID-19 vaccines is essential because they play a significant role in making crucial decisions regarding their children's health.

For the demographic profile of the participants among the three age groups, the younger age group (18-23 years old) had the least number of respondents, which was only 7.18% of the total sample size and may be attributed to the low number of young mothers in the locale. According to the 2015 census of the Philippine Statistics Authority in Lucena City, out of the 37,431 women who were married, only 1,671 were aged below 20 up to 24 years old. This age group also had a low number for women who were widowed (25 out of 8,092), separated (220 out of 3,021), and were in live-in conditions (4,391 out of 12,937).

In this study, more than half of the participants (56%) expressed reluctance to take COVID-19 vaccines. Various factors coincided with the perception of the participants regarding COVID-19 self- and child-vaccination. The survey showed that the top reason for the said reluctance was the perception that the COVID-19 vaccines are not safe and have serious side effects. People who are highly reluctant to receive COVID-19 vaccination often have safety concerns due to the fast-paced development of COVID-19 vaccines and the limited resources for their development phase. The participants also stated that they were reluctant to receive the COVID-19 vaccines because they did not know where to get reliable information regarding the vaccines, and they have heard negative news and dismissive reviews about the vaccines from people close to them. This finding agreed with the study in the United States which stated that the rise of mistaken fears and conspiracy theories about the vaccines can largely contribute to the perception of the general public. Furthermore, the topmost reasons for

reluctance in this survey also coincided with the results from a study conducted in Malaysia which found that reluctance to accept COVID-19 vaccines was due to the concern of the people regarding the safety, side effects, and effectiveness of the vaccines, as well as lack of reliable information. The participants also stated that they perceived religious leaders, politicians, teachers, and health care workers in their community to be supportive of the available COVID-19 vaccines. A study conducted in Egypt found that one of the reasons that could lead to higher vaccine acceptance rates was the recommendation of their government and public health authorities regarding the use of COVID-19 vaccines. In India, the general public's trust regarding COVID-19 vaccines was also heavily reliant on the approval of their government and medical professionals.

According to the study conducted by Fares et al., hearing bad feedback from others about their experience with COVID-19 vaccine was a significant factor that could affect the vaccination decision of an individual. In contrast, the result of this study showed that more than half of the respondents still wanted to accept the COVID-19 vaccine despite hearing negative feedback. This result could have been achieved since it was mentioned that the majority of the respondents believed COVID-19 vaccination to be necessary and effective. Moreover, some of the respondents stated that they did not want to be vaccinated with COVID-19 vaccines because they have heard negative feedback about the said vaccine. According to PAHO/WHO, one of the causes of widespread vaccine hesitancy is the quick spread of misinformation regarding vaccines. False-negative information may contribute to vaccine hesitancy which may ultimately lead to vaccine rejection. Thus, it must be addressed immediately to prevent others from refusing the vaccine. In terms of COVID-19 vaccination for children, the reluctance and refusal of the respondents can be correlated with the study of Bell *et al.*, which stated that mothers were more inclined to accept the COVID-19 vaccination for themselves than for their child/children. This study further showed that the leading reason for the refusal of COVID-19 vaccination for children was that the respondents perceived the said vaccines to be unsafe due to their potential side effects which coincides with the findings of the study conducted by Aldakhil *et al.* wherein concern for side effects was considered to be a highly significant factor of vaccine hesitancy for children. Moreover, it was found in the same journal that some of the mothers were hesitant due to the similar underlying factors included in our study, one of which was the perception of mothers that COVID-19 vaccine for their children was not needed and not effective.

A positive attitude was observed in nearly half of the mothers since 47% and 45.5% of the respondents agreed on the importance of self- and child-vaccination for COVID-19, respectively. Conversely, a considerable portion of the mothers remained neutral towards self-vaccination (34.9%) and child-vaccination (34.2%), while less than 10% of the respondents disagreed on the importance of the said vaccinations. These findings are consistent with the study of Bell *et al.*, who stated that the majority of their respondents have reported to be 'accepting' of the COVID-19 vaccine for themselves; others were unsure but leaning towards yes, while only a few have reported rejecting the COVID-19 vaccine. Furthermore, when asked about the acceptability of vaccination for their children, 48.2% stated their acceptance, while 40.9% answered being unsure but leaning toward yes in the same study.

The study by Bell *et al.* indicated that 95% of their respondents were mothers, and as previously mentioned, the parental attitudes they have evaluated were leaning more on the positive or 'accepting' side. Likewise, a study by Skirrow *et al.*, concluded that the vaccine acceptability of the mothers who participated in their study leaned more on 'accepting' a future COVID-19 for their children. In addition, they stated that 96% of the participants who were likely to accept self-vaccination for COVID-19 were also likely to accept COVID-19 vaccination for their child/children. This study also had similar results in that a high positive correlation ( $r=0.758$ ) was observed between the attitude of mothers regarding self- and child-vaccination for COVID-19. Based on this finding, participants who had a more positive attitude in terms of getting themselves vaccinated for COVID-19 were also likely to have a positive attitude in letting their children receive COVID-19 vaccination. Accordingly, mothers who had a more positive attitude towards child-vaccination were likely to have a positive attitude in accepting COVID-19 vaccination for themselves.

The Centers for Disease Control and Prevention recently approved the BNT162b2 (Pfizer-BioNTech) to be administered to children aged 12 to 15 years old, and they recommend the said age group to get vaccinated for COVID-19; Lovelace (2021) also reported that Moderna already confirmed expanding its COVID-19 vaccine clinical trial testing to children aged 5 to 11 years old. Considering these recent updates about child-vaccination for COVID-19, the observed relationship between self- and child-vaccination offers a promising result, should vaccines for children aged below 12 years old become available in the study locale. As mentioned by Anderson *et al.*, vaccinating children eligible

for vaccination will solidify community protection as it only occurs when most, if not all, individuals are vaccinated. Vaccinated persons block the chain of transmission of the COVID-19 virus, protecting community members.

This study, however, had its limitations. Given the travel restriction protocols at the time of data collection, the survey was conducted online through the dissemination of the web-based questionnaire across the Facebook platform, which limited the capability of the researchers to properly reach out to the target demographic and gain more insights. Consequently, a limited portion of the population of mothers in the study locale was obtained. It is also important to note that purposive sampling was used in this study, thus, restrictions were not employed for the minimum or maximum number of respondents per barangay. Future similar studies on a provincial scale should ensure the representation of each barangay to obtain results representative of the whole area.

## Conclusion

Among the participants who stated that they would refuse the available COVID-19 vaccines, most reasoned out that they were concerned about the safety and side effects. A similar case was seen with the hesitancy of the respondents to the potential COVID-19 vaccine for children below 16 years old. Therefore, it can be inferred that the main factor affecting COVID-19 vaccine hesitancy among the respondents was concern for the side effects with the administration of the available and potential COVID-19 vaccines. In addition, receiving positive feedback about the COVID-19 vaccine may decrease the likelihood of the respondents refusing the vaccine, which in turn, may decrease hesitancy.

The respondents generally had a positive attitude towards the COVID-19 vaccines, and agreed that having themselves and their children vaccinated with the COVID-19 vaccine will be important for their health as well as the health of others in their community. This general positive attitude towards the COVID-19 vaccines may be influenced by vaccine acceptance observed among the mothers, with a minority of nonacceptance least affecting the general attitude.

A high positive correlation was found between the attitude of mothers towards self- and child- vaccination for COVID-19 ( $r=0.785$ ). Participants with a more positive attitude towards self-vaccination were likely to have a positive attitude towards child-vaccination for COVID-19.



## Acknowledgments

We would like to express our gratitude to the mothers from Lucena, Quezon Province for their participation in this study. Also, we would like to thank Mr. Andhee Jacobe, Mr. Jerry Ching, Mr. Christian Ranche, Mr. Clarenz Concepcion, Ms. Diana Leah Mendoza, and Mr. Benjie Clemente for sharing their expertise and guiding us throughout the duration of the study.

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