

DETERMINANTS OF COVID-19 VACCINE UPTAKE INTENTIONS AMONG EMPLOYEES, PARENTS, AND STUDENTS IN AN EDUCATIONAL INSTITUTION

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ABSTRACT

One of the most affected sectors amidst the COVID-19 pandemic is the education sector as many classrooms in the world remained closed. To reopen the schools safely, it is important to vaccinate the members of the academic community. This descriptive-correlational research aimed to determine the factors that may influence the willingness of the students, parents, and employees to receive COVID-19 vaccines for the safe reopening of campus. A total of 877 responses were included in the analysis. Spearman rho was used to correlate the variables. The results showed that generally, the participants have a moderate level of knowledge about the COVID-19 vaccines and that they were concerned about the serious side effects of the COVID-19 vaccine; however, they were positive on the importance and benefits of the vaccine. The majority were undecided to receive the COVID-19 vaccines. The results further revealed that the determinants of vaccine uptake intentions among the participants in the education institution were age, educational qualifications, the extent of knowledge about the vaccine, and attitude towards the vaccine. A carefully planned communication strategy and education campaigns can help to influence the behavior of the students, parents, and school employees particularly the young adults on their vaccine uptake intentions. Topics on COVID 19 disease and vaccination may be integrated with the curriculum to promote widespread confidence in the vaccines.

Keywords: COVID 19 vaccines, vaccine uptake intention, health profile, attitude, Spearman rho, Philippines

INTRODUCTION

The COVID-19 pandemic which was declared on March 11, 2020, by the World Health Organization (WHO) has indeed brought worldwide unprecedented disturbance in the operations of the different government and private sectors in which the impact is seen heavily in the aspects of economy and health.

Along with the implemented health protocols and other community restrictions, vaccines are the foremost weapon to combat the COVID-19 infection. According to WHO (2021), getting vaccinated is one of the best ways to get protection from COVID-19. It is because, after

vaccination, the immune system is strengthened to fight the virus, thereby preventing illnesses.

In the Philippines, COVID-19 vaccination started in March 2021 with a target of 58 million people by the end of the year (SRD, 2021). One of the factors to control the pandemic is the willingness of the people to be vaccinated. Lin, Tu, and Beitsch (2021) noted that to achieve herd immunity, vaccines should be effective and that people are willing to accept them. Reaching herd immunity requires high COVID-19 vaccine uptake. COVID-19 herd immunity requires an estimate of 50% to 80% population with the level of immunity acquired either by vaccination or natural infection recovery (Fontanet and Cauchemez, 2020).



Previous studies have accounted for vaccine hesitancy and the skepticisms of the people worldwide on COVID-19 vaccines. Surveys have been done and the results continue to change. Factors are being investigated why people are skeptical of the COVID-19 vaccination.

Vaccine uptake intake is reduced by the concerns of the people about rushed vaccine development and the willingness to get the vaccine under emergency use authorization or EUA (Guidry et al., 2020) while concerns about the vaccine causing long-lasting health problems and uncertainty about the benefits of the vaccine were also common (Daly, 2020). Wang et al. (2021) also observed that concerns about vaccine safety decrease people's willingness to be vaccinated.

In the review of the literature, it was found that age is one of the factors that may influence vaccine intentions where younger adults are more likely unwilling to be vaccinated (Guidry et al., 2020; Tubeuf, Kessels, Luyten, and Tubeuf, n.d; Daly, 2020; Khubchandani et al., 2021; Lindholt, 2020; Sherman et al., 2020; Al-adhi & Al-mohaithef, 2020; Kourlaba et al., 2021; Roozenbeek et al., n.d; Yoda, 2021) while Alley et al. (2021) found no association between age and vaccine intention. Furthermore, females and those with low levels of education were found to be less willing in receiving the vaccines (Kessels et al., n.d.; Paul et al., 2020; Daly, 2020; Lindholt, 2020; Alley et al., 2021).

Most of the previous studies conducted were from the US, UK, Middle East, Canada, and Japan. There were limited studies yet in the Philippine setting, particularly those that involved educational institutions. One was examined by Cahapay (2021) involving 1070 K to 12 teachers from Mindanao. It was found that a majority of the teachers are not certain about whether they will be vaccinated against COVID-19 or not. Further, it was revealed that monthly income, gender, and educational attainment were significantly associated with the intention to be vaccinated against COVID-19.

One of the most affected sectors due to the pandemic is education. With the lockdowns, the world is facing an education crisis as classrooms remain closed. According to United Nations Children's Fund (UNICEF), at least 1 in 3 schoolchildren had no access to remote learning.

Since the cost of school closures on health, well-being, and learnings of students has been devastating, UNICEF (2021) urged the governments to prioritize support for schools and take all possible measures to reopen safely.

One of the measures is the vaccination of the members of the academic community. With all the literature presented, the researchers were driven to investigate the factors that may influence the willingness of the students, parents, and employees to receive COVID-19 vaccines for the safe reopening of campus. Reopening face-to-face classes will depend on the capability of the schools to comply with the health and safety protocols, to retrofit the school facilities, and to get the support and cooperation of the stakeholders.

The conceptual framework of this study dwells on the investigation of the COVID-19 vaccine uptake intentions of the stakeholders of one educational institution in the Philippines. The availability of the COVID-19 vaccines has been one of the most effective strategies in the global effort of eradicating this infectious disease. However, vaccine hesitancy exists among the population. The SAGE Working Group defined vaccine hesitancy as the "delay in acceptance or refusal of vaccination despite the availability of vaccination services" (Macdonald and Group, 2015). The decision of the people whether to reject, delay or accept the vaccines may be influenced by several factors.

In this study, the researchers examined participants' demographic profile in terms of age, gender, civil/marital status, educational qualifications, family monthly income, and family size; health profile which pertains to health-related habits and presence of chronic disease; knowledge about COVID-19 vaccines; and their attitude towards COVID-19 vaccination.

Determining the predictors of the COVID-19 vaccine uptake intentions among employees, parents, and students in educational institutions may contribute to the further development of strategies and public health mechanisms for the wide acceptance of vaccines among the stakeholders of learning institutions.

OBJECTIVES OF THE STUDY

This study was conducted to 1) describe the demographic profile of the participants according to age, gender, civil/marital status, educational qualifications, family monthly income, and family size; (2) describe the health profile of the participants to smoking status, alcohol use, physical activity/exercise, and history of chronic disease; 3) determine the level of knowledge of the participants on COVID-19 vaccines; 4) describe the attitude of the participants towards COVID-19 vaccination; 5) determine the vaccine uptake intentions of the participants; and 6) establish a significant relationship between the participants' vaccine uptake intentions and their demographic profile, health profile, and attitude towards COVID-19 vaccination.

METHODOLOGY

This study utilized the descriptive-correlational research design as it aimed to establish a significant relationship between the participants' vaccine uptake intentions and their demographic profile, health profile, knowledge on COVID-19 vaccines, and attitude toward COVID-19 vaccination.

The researchers desired total enumeration; however, only those who will participate based on their responses in the informed consent, and 18 years old and above were included. During SY 2020-2021, the target education institution which is located in Central Luzon, Philippines has a total of 1,288 students from the Senior High School to Graduate School; 649 from the Elementary to Junior High School; 67 non-teaching personnel; and 72 teaching personnel. Parents of the minor students were also requested to participate. There was a total of 997 who answered the survey questionnaire in Google form. In the analysis of the responses, 120 were eliminated since they did not meet the criteria; i.e., below 18 years old and with a response of disagreement in the informed consent. Overall, a total of 877 responses were included in the analysis. The majority or 58.4% were students, 31.8% were parents, 6.7% were teaching personnel, and 3.1% were non-teaching personnel.

The Google form was used for the survey. It has five sections. Section 1 is the informed consent where the participants signify their willingness to participate in this study; Section 2 asks about the demographic profile of the participants; Section 3 on health profile; Section 4 on their receptivity to COVID-19 vaccine; and Section 5 dwells on the participants' attitude towards COVID-19 vaccination. Nine items were adapted from the questionnaire of Daly and Robinson (2020) with permission. The questionnaire was subjected for validation and pretesting. The Google form contains the informed consent in which the participants signify their voluntary participation in this research without any remuneration. The questionnaire was posted to the respective group chats of the teachers, staff, and students from March 5 to March 21, 2021.

The google form responses were downloaded for data treatment. Frequency, percentage, and Spearman rho correlation were used. The SPSS version 21 was used to run the statistical tests. To interpret the obtained Spearman correlation coefficients, Dancy and Reidy's (2004) categorization was used. P-values less than .05 were considered significant.

RESULTS AND DISCUSSION

1. Demographic Profile of the Participants

Based on the demographic profile of the participants, the majority, or 61.8% aged 18-29 years old. There were 657 (74.9%) females and 220 (25.1%) males who participated in the survey. Among the 877 participants, 591 (67.4%) were single and 255 (29.1) married. Most of them were college students (279 or 31.8%) and 337 or 38.4% have a monthly family income of ₱11, 690.00-₱23,380.00. More than half of the respondents belonged to the lower-income to lower-middle-income class with a family income of below ₱23,380.00 per month. In terms of family size, 233 or 26.6% have a household size of four members while 228 or 26% have five members. It can also be noted that there were 25 (2.9%) participants with more than 10 members.



2. Health Profile of the Participants

Data on the health profile of the participants reveal the majority were non-smokers (716 or 81.6%), non-alcohol drinkers (478 or 54.5%), and most of them performed physical activities/exercises occasionally (605 or 69.0%). The results show that the participants were in good health.

Table 1
Health profile of the participants

Health Habits	Not at all	Occasional	Daily	Mean	Std	Description
Smoking Status	716 (81.6%)	126 (14.4%)	35 (4.0%)	1.22	0.504	Not at all
Alcohol use	478 (54.5%)	393 (44.8%)	6 (.7%)	1.46	0.512	Not at all
Physical activity/exercise	96 (10.9%)	605 (69.0%)	176 (20.1%)	2.09	0.55	Occasional

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Table 2
Presence of chronic disease among the participants

Chronic Diseases	Present	% of N=877
Diabetes	35.00	4.00
Stroke	9.00	1.00
Chronic kidney disease	7.00	.80
Chronic lung Disease	7.00	.80
Asthma	71.00	8.10
Heart Disease	16.00	1.80
Cancer	7.00	.80
Others	31.00	3.50
None at all	717.00	81.80

Considering the participants' history of chronic disease, 717 or 81.8% percent did not suffer from any chronic disease as shown in Table 2. It can be noted that 71 (8.10%) have asthma, 35 (4%) have diabetes and 16 (1.80%) have heart disease. Thirty-one participants have answered others, which they indicated as hypertension and allergies.

3. Knowledge of the Participants about the COVID-19 Vaccines

Table 3
Knowledge of the participants about the Covid-19 vaccine

Level of Knowledge	Frequency	Percent
Very low	38	4.3
Low	82	9.4
Moderate	363	41.4
High	337	38.4
Very high	47	5.4
Missing Responses	10	1.1
Total	877	100.0

Table 3 presents that the majority of 41.4% of the participants have a moderate level of knowledge about the vaccine, 38.4% have a high level of knowledge, 9.4% with a low level of knowledge, 5.4% with a very high level while 4.3% have a very low level of knowledge pertaining to the COVID-19 vaccines. The results may imply that although a good number of the participants have knowledge about the profile, benefits, and efficacy of the vaccines, there was still a need for an extensive information campaign to increase trust and confidence in the vaccination program of the government.

4. Attitude of the Participants towards the COVID-19 Vaccines

Considering the attitude of the participants towards the COVID-19 vaccine in general, they agreed with the statement I am concerned about the serious side effects of the COVID vaccine ($x=4.18$); The COVID-19 vaccine will be effective if it is approved by the Food and Drugs Administration, Department of Health, or Center for Disease ($x=3.79$); Getting the COVID-19 vaccine will be important for the health of others in my community ($x=3.71$); I will do what my doctor or health care provider recommends about the COVID-19 vaccine ($x=3.68$); Getting a COVID-19 vaccine would be a good way to protect me from coronavirus disease ($x=3.56$); There are other ways to prevent COVID-19 than with a vaccine ($x=3.56$); The COVID-19 vaccine will be important for my health ($x=3.52$); The COVID-19 vaccine will



be beneficial to me ($x=3.52$), and I do not understand the full safety profile of the vaccine ($x=3.50$). Meanwhile, the participants are generally undecided if the COVID vaccine might cause lasting health problems ($x=3.47$); the benefits of COVID-19 vaccine, in general, are larger than their risks ($x=3.43$); and COVID-19 vaccines can cause serious reactions to the body ($x=3.40$), strengthen the immune system ($x=3.37$), are effective ($x=3.22$); and are safe ($x=3.20$).

5. COVID-19 Vaccine Uptake Intentions of the Participants

Table 4
Vaccine uptake intention of the participants

Vaccine Intention	Frequency	Percent
Unwilling	212	24.2
Undecided	483	55.1
Willing	182	20.8
Total	877	100.0

Data on the vaccine uptake intentions of the participants are shown in Table 4. Out of 877 participants, 483 or 55.1% were undecided, 212 or 24.2% were not willing to be vaccinated, and 182 or 20.8% were willing to be vaccinated. Based on the data, the majority were not yet decided on whether or not they will receive COVID-19 vaccines.

Table 5
Vaccine preference of the participants

Vaccine Preference	Frequency	Percent
Not Applicable (Unwilling/Undecided to be vaccinated)	346	39.5
Sinovac (China)	34	3.9
Sputnik V (Russia)	6	.7
Novavax (USA)	16	1.8
Janssen (USA)	18	2.1
AstraZeneca (UK)	66	7.5
Moderna (USA)	100	11.4
Pfizer-BioNTech (Germany)	291	33.2
Total	877	100.0

In terms of the preferred vaccine of the participants who were willing to be vaccinated and those who were partly decided on it, the majority (291 or 33.2%) preferred the Pfizer-BioNTech vaccine of Germany. This was followed by the

Moderna vaccine of the USA (100 or 11.4%), AstraZeneca of UK (66 or 7.5%), and Sinovac of China (34 or 3.9%). There were 346 or 39.5% of the participants who did not respond to this item.

6. Relationship between the Vaccine Uptake Intention of Participants and their Demographic Profile

Table 6
Relationship between the vaccine uptake intention of participants and their demographic profile

Demographic Profile	Vaccine Intention	
	Correlation coefficient	p-value
Age	0.122**	0.000
Sex	0.080	0.057
Civil/Marital Status	0.068	0.673
Educational Qualifications	0.106**	0.002
Monthly Family Income	0.089	0.008
Family Size	-0.068	0.043

**significant at $p\text{-value} < 0.01$

The relationship between the vaccine uptake intention of participants and their demographic profile is presented in Table 6. Data show that sex, civil/marital status, family monthly income, and family size were not significantly related to the vaccine uptake intentions of the participants. These results are not in consonant with the findings of Kessels et al. (n.d.); Paul et al. (2020); Daly (2020); Lindholt (2020); and Alley et al. (2021) on sex; Al-mohaithef and Padhi (2020) on civil/marital status; and Khubchandani et al., (2021) on income as determinants of vaccine intention.

However, in this study, it was found that age and educational qualifications have a significant relationship with the intention of the participants to be vaccinated at a one percent level of significance. The results support the previous findings that age is a determinant of vaccine uptake intentions (Malik et al., 2020; Guidry et al., 2020; Kessels, Luyten, & Tubeuf, n.d.; Daly, 2020; Khubchandani et al., 2021; Lindholt, 2020; Sherman et al., 2020; Al-mohaithef and Padhi, 2020; Kourlaba et al., 2021; Roozenbeek et al., n.d.; Yoda & Katsuyama, 2021), as well as the educational qualifications wherein those with



higher levels of education were more likely to accept the vaccines (Malik et al., 2020; Cahapay, 2021).

7. Relationship between the Vaccine Uptake Intention of Participants and their Health-related Habits and History of Chronic Disease

Table 7
Relationship between the vaccine uptake intention of participants and their health-related habits (N=877)

Health-related Habits	Vaccine Uptake Intention	
Smoking Status	Corr. Coefficient	.067
	p-value	.046
Alcohol Use	Corr. Coefficient	.073
	p-value	.030
Physical activity/exercise	Corr. Coefficient	.042
	p-value	.215

In Table 7, data reveal that health-related habits which include smoking status, alcohol use, and physical activity/exercise were not determinants of the intention of the participants to be vaccinated having correlation coefficients of below 0.10.

Table 8
Relationship between the vaccine uptake intention of participants and history of chronic disease

Chronic Disease	Vaccine Intention	
	Corr. coefficient	p-value
Diabetes	0.098	0.014
Stroke	0.046	0.387
Disease	0.059	0.218
Chronic Lung Disease	0.062	0.185
Asthma	0.071	0.107
Heart Disease	0.007	0.98
Cancer	0.023	0.796
None at all	0.074	0.091
Others	0.027	0.731

Similarly, it can be seen in Table 8 that vaccine uptake intentions of the participants and their history of chronic disease were not significantly related. Having diabetes, stroke, disease, chronic lung disease, asthma, heart disease or none were not determinants of vaccine uptake intentions of the participants.

8. Relationship between the Vaccine Uptake Intention of Participants and their Level of Knowledge on COVID-19 Vaccine

Table 9
Relationship between the vaccine uptake intention of participants and their level of knowledge on Covid-19 vaccines

Vaccine Intention	Level of Knowledge					Total
	Very Low	Low	Moderate	High	Very high	
Unwilling to be vaccinated	14	22	77	80	16	209
Undecided	19	48	236	168	6	477
Willing to be vaccinated	5	12	50	89	25	181
Total	38	82	363	337	47	867
Spearman correlation	0.119**					
p-value	0.0001					

**significant at p-value<0.01

Table 9 shows that there was a significant weak relationship between the participants' intention to be vaccinated with the COVID-19 vaccine and their level of knowledge. It can be surmised that the extent of knowledge people has about the vaccine may influence their intention and willingness to be inoculated with the vaccine. The result is similar to the previous findings that knowledge about the COVID-19 vaccines contributes to the willingness of people to be vaccinated (Paul et al., 2020; Kourlaba et al., 2021; Iorfa, Ottu, Oguntayo, & Ayandele, 2020).

9. Relationship between the Participants' Vaccine Uptake Intention and their Attitude towards the COVID-19 Vaccines

Data show that there was a significant moderate relationship between the willingness of the participants to be vaccinated and their attitude towards the vaccine. Those who were willing to be vaccinated believe that the COVID-19 vaccine is important in one's health (rs=0.545) and in the

health of others in the community ($rs=0.473$), a good way to protect from the coronavirus disease ($rs=0.541$), beneficial ($rs=0.533$), effective ($rs=0.412$), and safe ($rs=0.409$). Participants' intention for vaccination is also influenced by the recommendations from their doctor or health care provider ($rs=0.482$). These findings are parallel with the findings of Yoda & Katsuyama (2021); Taylor et al. (2020); Hickler, Guirguis, and Obregon, (2015) on the peoples' attitude towards vaccine safety and vaccine effectiveness.

Data further revealed that a significant weak relationship exists between the vaccine intention of the participants and their attitude towards the vaccine in terms of the following: (1) The COVID-19 vaccine will be effective if it is approved by the Food and Drugs Administration, Department of Health, or Center for Disease Control and Prevention ($rs=0.389$), (2) COVID-19 vaccines strengthen the immune system ($rs=0.386$), and (3) The benefits of COVID-19 vaccine, in general, are larger than their risks ($rs=0.353$).

On the other hand, there was no significant relationship observed between the vaccine intention of the participants and their attitude towards the vaccine in terms of the following: (1) concerns about the serious side effects of the COVID vaccine ($rs=-0.07$); (2) possible lasting health problems the vaccine may cause (0.049), (3) ways to prevent COVID-19 than with a vaccine ($rs=0.057$), (4) serious reactions the vaccine may cause to the body ($rs=0.050$), and (5) understanding on the full safety profile of the vaccine ($rs=0.039$).

CONCLUSION

The results reveal that the majority of the participants have a moderate level of knowledge about the COVID-19 vaccines. Given that they belong to the educational institution and that to reopen the campus safely requires the vaccination of the employees and students, among others, the stakeholders should be provided with much knowledge and information about the COVID-19 disease, the behavior of the viruses, vaccines, and drug targets. The majority of the participants are undecided to receive COVID-19 vaccines. Hence,

knowing the factors that may influence their vaccine uptake intentions may serve as good basis for the crafting of programs and communication strategies that will improve their behavior towards the COVID-19 vaccines.

Further, the researchers concluded that age, educational qualifications, the extent of knowledge towards the COVID-19 vaccines, and attitude towards the vaccines are determinants of the vaccine uptake intentions of the people in the educational institutions. Intention to receive the COVID-19 vaccines can be seen among people who are older, with higher educational qualifications, a higher level of knowledge about the vaccines, and with a positive attitude towards the vaccines.

Authorities from the Department of Health, Food and Drugs Administration, and Center for Disease Control and Prevention; as well as medical doctors and other health care providers play a significant role in convincing the people to be vaccinated. The profile of the vaccines, their benefits, safety, and effectiveness should be well documented and disseminated to the people.

RECOMMENDATION

The government, medical, religious and school leaders should utilize a carefully planned communication strategy that involves dialogues/orientation, mass electronic media, digital media, print media, and mobile technology to influence the behavior of the students, parents, and school employees, particularly the young adults concerning their vaccine uptake intentions. Further, educational institutions should conduct education campaigns among the stakeholders and integrate topics about COVID-19 disease and vaccines in the education curriculum to understand the full safety profile of the COVID-19 vaccines and to promote widespread confidence in the vaccines.

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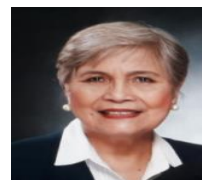
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