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Research Article

COVID-19 Vaccine Acceptability Among Pregnant Women in a Tertiary Health Care Facility

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Abstract

Background / Introduction: Covid 19 Vaccines are effective public health interventions against viral outbreaks and pandemics through primary prevention. No study has been reported yet on the acceptability of the COVID-19 vaccine among pregnant women in Philippines.
Aims and Objectives: To determine the acceptance of a COVID-19 vaccine among pregnant women.
Materials and Methods: A cross-sectional, descriptive study using a questionnaire conducted at a tertiary Hospital in Olongapo City. Logistic regression analysis is performed to determine the factors for vaccine acceptability among pregnant women.
Results: More than half of pregnant women (60.25%) accepted COVID-19 vaccination. Those above 30 years of age were almost twice likely (Odds Ratio=1.9, CI: 1.2 – 3.2) to accept the vaccine, compared to those who were 30 years old or younger. Women who were married or living with a partner were likewise 2.1 times more likely (OR=2.1, CI: 1.1 – 3.9) to accept the vaccine than single parent women. Furthermore, pregnant women who at least reached college-level education were 2.2 times more likely (OR = 2.2, CI: 1.3 – 3.6) to accept the vaccine. On the other hand, employed or self-employed pregnant women were 1.3 times more likely to have themselves vaccinated against COVID-19. Those in the first or third trimester of pregnancy were much more likely to accept the COVID-19 vaccine as compared to those on their second trimester of pregnancy (Odds Ratio = 12.7 and 17.7, respectively). Similarly, pregnant women with a comorbidity were found to be 3 times more likely to have themselves vaccinated. Although, their computed OR did not show statistical significance, the trend noted is applicable to the sample women in this study but not to the larger population of pregnant women.
Conclusion: Majority of the participants accept the COVID 19 vaccine regardless of the disparities in numbers vis a vis demographics and knowledge. Public health workers working hand-in-hand with Local Government Unit (LGU) efforts must be commended in their ongoing efforts towards COVID-19 vaccine acceptance. Mass campaign through education emphasizing benefits of the vaccine must continue to attain the biggest impact.

Key words: early pregnancy loss; sample quality; chromosome abnormalities

Introduction

A global pandemic posing a major threat worldwide is the current 2019 coronavirus disease, known as COVID-19, and is caused by a severe acute respiratory syndrome called coronavirus-2 (SARS-CoV-2). Recent reports have raised concerns of negative outcomes in pregnancy such as preterm birth, neonatal pneumonia, vertical transmission of COVID-19 to the fetus and postpartum infections [1-8]. Several effective vaccines are now available for use worldwide. [14] However, the mere availability of a vaccine will not guarantee the uptake. For example, a vaccine against influenza A H1N1 was offered before, or at the onset of the second epidemic wave, but vaccination rates were found to be lower than expected, with a population coverage ranging from 0.4 to 59% across 22 countries in 2009[15].The low uptake of an effective and available vaccination for high-risk infections has been defined as a ''Pandemic public health paradox'', to which vaccine hesitancy group explained as ''The reluctance or refusal to vaccinate despite the

availability of vaccines'' [16]. It is also reported that while the hesitancy level and reasons for vaccine acceptance may vary by the vaccine itself, geographic location, the health system, accessibility and availability can also be driven by emotional, cultural, social, and political factors as much as by cognitive factors [17]. It is known that the vaccine demand in low-and middle-income countries (LMICs) is less well-studied and there may be different considerations from the population compared to high-income countries [18]. LMICs may have less capacity to introduce new vaccines and may need to deal with populations which have hesitant beliefs [19]. Some studies have been conducted and found a poor uptake on new vaccines against emerging and re-emerging infectious diseases in Southeast Asia, such as for Dengue fever [20-22], Zika [23]and Ebola [24]. Factors contributing to vaccination acceptance usually included personal risk perceptions, vaccination attitudes or motivation, information sources, access and demographic variables, as well as social influences and practical factors [25].A recent study from Indonesia on the acceptance of the COVID-19 vaccine found that 93.3% of the respondents would accept a vaccine if it is 95% effective, but the acceptance decreased to 67.0% for a vaccine with 50% effectiveness [26].Factors associated with the acceptance of the vaccine were its effectiveness, being healthcare workers and having a higher perceived risk of COVID-19 infection and if the vaccine is offered for free [26]. A web-based study recently conducted in Saudi Arabia found that 64.7% showed interest in accepting the COVID-19 vaccine if it became available. However, the willingness to accept the vaccine varied among different age groups, marital status, the participant's education level and type of employment [27]. A study from China found a 72.5% acceptance rate of the vaccine in the general population. Vaccine with safety and social contact's decisions were the most important predictors [25][28]. In South Africa, the vaccine acceptance rate is poor. A study conducted among private health insurance members during 2015 found that only 5.0% received the influenza vaccine [29]. Priority risk groups such as pregnant women, older adults, and those with a medical condition, were significantly more likely to be vaccinated, as they were members belonging to insurance schemes that offered a specific influenza vaccine benefit. A similar finding was reported from a Primary Health Care (PHC) setting over a four-year period where the mean annual influenza vaccine coverage among patients was 4.5% [30]. However, no study has been reported yet on COVID-19 vaccine acceptance in any southeast Asian country notably on pregnant women as a known vulnerable population.

Local Literature Review

The Philippine government originally aimed to start its vaccination program as soon as February 2021[29]. The government was aiming to secure at least 148 million vaccine doses and vaccinate 50 million to 70 million Filipinos within the year to reach herd immunity against COVID-1[32]. The Philippine Department of Health (DOH) has also expressed optimism that the country will receive around 44 million doses through the COVID-19 Vaccines Global Access (COVAX) facility, which "provides governments with the opportunity to benefit from a large portfolio of COVID-19 candidate vaccines using a range of technology platforms, produced by more manufacturers across the world, with a bigger market to provide security of demand [33].A Pulse Asia survey November 3 to December 2, 2020, revealed that almost half (47%) of Filipinos said they are not willing to get vaccinated against COVID-19. Meanwhile, an independent survey in NCR by the OCTA Research, an independent interdisciplinary group composed of scientists from the University of the Philippines (UP), the University of Santo Tomas (UST), and Providence College in the United States, showed that only 25% percent of 600 respondents aged 18 above are willing to be vaccinated against COVID-19[50]. Previous studies have shown that people will have high vaccine acceptability if it is recommended by their healthcare providers and professionals [52,53]. Several health beliefs have been correlated in past studies with vaccine acceptability, such as the perceived vaccine effectiveness and potential vaccine harms. This, according to Reiter, Pennell, & Katz (2020), are a central construct of multiple health behavior theories such as the Protection Motivation Theory [54,55]. A meta-analysis

conducted by Xiao & Wong (2020) on vaccine hesitancy and perceived behavioral control demonstrated the behavioral health model like the Theory of Planned Behavior in explaining vaccine hesitancy. Several studies have urged to enhance tailored interventions and policies to target such beliefs related to vaccine hesitancy in improving knowledge and attitude towards vaccines and increasing vaccination uptake [56,57] A few studies have explored the prevalence of COVID-19 vaccine acceptance and its determinants, in the cities of Caloocan, Malabon, and Navotas. These cities recorded the lowest daily attack rate of COVID-19 among the 17 local government units in the National Capital Region (NCR) according to OCTA Research [58]. Informal surveys on COVID-19 vaccination in these cities have been conducted, showing no sufficient information on the determinants of vaccine acceptance or hesitancy. In Navotas City, a majority of the residents were willing to get vaccinated of their "preferred" 84.2% Pfizer vaccine [58-60]. In Malabon, only a third of residents (35.7%) were willing to be vaccinated [61]. On the other hand, in Caloocan, 95% of 13,000 respondents were willing to be vaccinated [62]. In this background, the general objective of this study is to determine the rate and factors for COVID-19 vaccine acceptance among pregnant women in a tertiary health care facility.

The specific objectives are:

1. To determine the association of demographic variables with acceptance of Covid 19 vaccine, and
2. To determine the association between knowledge, attitude, and practice with vaccine acceptance.

I. Materials And Method

A. This is a cross-sectional descriptive study using a questionnaire conducted at Tertiary Hospital from December 1, 2021 to April 30, 2022.

B. Settings and Subjects

Tertiary hospital level III hospital with major departments accredited for residency training. Most of the high-risk charity patients were being referred to this institution by numerous lying-in centers. Hence called, the non-covid and covid 19 referral hospital of Olongapo city. Most of these patients were reliant on public health facilities such as the Tertiary hospital as it provides free of cost services. There were over 20 headcounts at the out-patient department (OPD) per week and of these, about 150 were antenatal admissions per month. The facility provides comprehensive free maternal and antenatal care package based on DOH and PHILHEALTH guidelines.

C. Sample Size

Total enumeration of pregnant women consults as well as admissions at Tertiary hospital for the period December 1, 2021 to April 30, 2022.

Participant selection and data collection

Participants were recruited from those who attended the antenatal clinic and obstetric admission during the study period.

All patients including pregnant women attending the Tertiary hospital during this pandemic, were screened for COVID-19 symptoms and if found positive were isolated for further care.

All pregnant women attending the antenatal clinic during the study period were recruited. Those exhibiting symptoms of COVID-19 such as fever, cough, colds, sore throat, body pain etc. based on triage, were excluded from the study.

A written invitation (Annex I) with the aim and objectives were explained to participants in English and or Filipino. The participants were assured that they were not discriminated against regarding their antenatal consultation should they refuse to participate.

Data was collected using a structured questionnaire administered by the researcher. Universal precaution measures were adopted during the data collection.

A two-page questionnaire was adopted (Annex II) from European Journal of Medical and health sciences. (https://ejmed.org/index.php/ejmed/article/view/493?fbclid=IwAR32 68L4a1O4jsMFFR13qEauRz2_0Y6WysAqgwlSarhr6AGo2ZjItEz2e TA): This research questionnaire underwent face and content validation based on a paper entitled women's demographics, knowledge, attitudes and practice on COVID-19 infection that has been published abroad. The questionnaire is translated in English and with Filipino Translation (Annex I). Accomplished questionnaires were checked immediately for completeness. This was tested initially to 10 participants prior to large scale data collection.

In a study where 400 participants were recruited, 50 failed to complete the questionnaire, resulting to dropout rate of 12.5 %.

D. Questionnaire
  I. Demographic questions include age, address, contact no., email address, marital status, educational attainment, occupation, parity, and age of gestation (AOG). It also includes the vaccination status and comorbidities
  II. Knowledge
  IIa. The knowledge questions include from where or whom have the patient received information regarding the vaccine such as newspaper, social media/internet, barangay, friends and relatives.
  IIb. The six specific symptoms of COVID-19 with yes or no answers include the following symptoms: cough, sore throat, body pain, fever, difficulty in breathing and tiredness.
  IIc. There were seven true or false questions The true or false questions were the following: the virus survives for days outside the body in the open air, the virus survives for days outside the body on a plastic surface, most people who get COVID-19 become very ill, smokers who get COVID-19 are more likely to get ill than non-smokers, you can have the virus without any symptoms, children get less ill from the virus than adults and only elderly people die from COVID-19.
  III. Attitude
  The attitudes of the respondents were measured by five questions with yes or no answers: you may get infected by COVID-19, anyone in their family may get infected, the COVID-19 epidemic is a serious infection, the tertiary hospital will be able to handle the COVID-19 pandemic in the region and the government has provided sufficient information on the COVID-19 pandemic.
  IV. Practices
  The six practice questions consist of: do you cover your mouth when you sneeze or cough, do you use a face mask when you go to public places, do you keep a distance of 1-2 meters in public places, do you wash or sanitize your hands once you enter your house coming from outside, would you visit your family or friends during the COVID-19 epidemic and, would you visit a person who is diagnosed and isolated for a COVID-19 infection?
  E. Measurements

The knowledge, attitudes and practices score of COVID-19 infection were measured using a score of one [1] for the correct and zero [0] for incorrect answers or positive [1] and negative [0] statements. Total knowledge, attitudes and practices score were measured by adding the scores for the correct answers or on positive statements.

F. Data analysis
Data was encoded using Microsoft Excel, and analyzed via SPSS version 22. Descriptive statistics such as mean with standard deviation (SD) for continuous variables and frequency distribution for categorical variables were undertaken. Chi-square test and binary logistic regression were carried out to identify the factors for COVID-19 vaccine acceptability. P-values <0.05 set was considered to be statistically significant.

G. Ethical consideration
Ethical approval was granted by Research Ethics Committee. Participation was voluntary, and any respondent may discontinue participation at any time without prejudice.
The study questionnaire contained a consent section that stated the purpose, nature, objectives of the study, declaration of confidentiality, and anonymity.

Results

A total of 400 pregnant women participated in this study. More than half (67.3%) were between 14 to 30 years of age with mean of 22 years old. The level of maturity usually increases with age. In psychology, maturity can be operationally defined as the level of psychological functioning and decision making. Unlike younger counterparts whose decision making maybe largely influenced by their guardians or elders [63]. More than two-thirds (81.8%) had a partner, either married or unmarried. A strong relationship support increases the vaccination rate based on relationship surveys conducted abroad [64]. A vaccine meant to combat a pandemic does not work at an "individual level" but on a family level. There is a higher need to protect one another since the virus is highly transmissible at home [65]. Two-thirds (74%) were unemployed, with majority (61.8%) unable to reach college-level education.

Similar to a study conducted in John Hopkins University noted the relationship between education level and vaccine acceptance varies across countries and geographic regions.[66] In most countries, individuals with college education or higher are more open to accepting a COVID-19 vaccine because higher education can lead to better understanding of the vaccine benefits and efficacy, effects on immunity, and benefits can outweigh the adverse effects of Cacho et al. Hence, increase the likelihood of vaccine willingness to more educated patients.[67] The Philippine government's coronavirus task force has required the COVID-19 vaccination of employees doing on-site work, both public and private, in areas where there are enough supplies of COVID-19 vaccines. Presidential Spokesperson Harry Roque made the announcement last November 12, 2021. Hence, this advice came up to ramp up vaccination coverage as the government also eyes mandatory inoculation of the Philippine population.[68]

As regards age of gestation (AOG), majority (68.3%) were on their 2nd trimester of pregnancy and had 2 or more previous pregnancies. Only about 5% of the women in this study reported having a comorbidity (Table 1). Last Aug 12, 2021 Revised guidelines of DOH re-categorized pregnant patients as extended A3, along those with comorbidities and immunocompromised. Secretary Vergeire last March 2022 emphasized that "high-risk" pregnant women in their first trimester can be vaccinated as well, especially those with co morbidities [69]. It could be that majority of the patients either decide "earlier" due to benefits of vaccine, as compared to those with co-morbidities, or decide later such as those in their 3rd trimester of pregnancy, presumably understanding the stage of organogenesis has passed, lowering the risk of congenital malformation. Furthermore, vaccination prevents COVID 19 infection that may lead to possible preterm labor.Table 1 also shows that about three of every five pregnant women (60.25%) accepted the COVID-19 vaccine and had themselves vaccinated. Vaccine acceptance was found to be significantly associated with the following socio-demographic

and clinical characteristics (p < 0.05): relatively older age (31 & above), having a partner, reaching at least college level of education, being employed / self-employed, being in either 1st or 3rd trimester of pregnancy and having a comorbidity. No significant association was found between COVID-19 vaccine acceptability and parity (p > 0.05).

Socio-Demographic and Clinical Characteristics Clinical Characteristics			Unvaccinated	Vaccinated	% (n = 400)	P
Age	30 & below	n	118	151	269	0.016
		%	43.9%	56.1%	67.3%	
	31 & above	n	41	90	131	
		%	31.3%	68.7%	32.8%	
Marital status	Single mother	n	38	35	73	0.018
		%	52.1%	47.9%	18.3%	
	Married / living with a	n	121	206	327	
		%	37.0%	63.0%	81.8%	
Educational	High school or lower	n	116	131	247	0.000
		%	47.0%	53.0%	61.8%	
	At least college level	n	43	110	153	
		%	28.1%	71.9%	38.3%	
Occupation	Unemployed	n	129	167	296	0.008
		%	43.6%	56.4%	74.0%	
	Employed / self-	n	30	74	104	
		%	28.8%	71.2%	26.0%	
Gestational age at	1st Trimester	n	3	40	43	0.000
		%	7.0%	93.0%	10.8%	
	2nd Trimester	n	151	140	291	
		%	51.9%	48.1%	72.8%	
	3rd Trimester	n	5	61	66	
		%	7.6%	92.4%	16.5%	
Parity	0 to 1	n	54	78	132	0.740
		%	40.9%	59.1%	33.0%	
	2 or more	n	105	163	268	
		%	39.2%	60.8%	67.0%	
Comorbidities	No comorbidities	n	156	226	382	0.048
		%	40.8%	59.2%	95.5%	
	With comorbidities	n	3	15	18	
		%	16.7%	83.3%	4.5%	
		Total	159	241	400	
		%	39.75%	60.25%	100.00%	

p: p-value from chi-square test.

Table 1: Frequency of socio-demographic and clinical characteristics with covid-19 vaccination

Results showed a low mean knowledge score of 5.8 out of 12 (SD=3.4). Few of the participants knew about the symptoms of a COVID-19 infection. This may be because of the idea that a person can have the virus without any symptoms, as indicated by almost 80% (77.3%). Moreover, almost a half of the participants (48.8%) knew that children get less ill from the virus than adults but not only elderly people die from COVID 19. 3 out of 4 (76.3%) knew of the virus survival outside the body in the open air, while more than half answered that the virus can also survive on a plastic surface (60.5%) (Table 2). Although knowledge on COVID-19 was not satisfactory, the attitude of the respondents was highly positive as the mean score was 4.4 out of 5 (SD=1.3). Approximately 9 per 10 pregnant women felt that they may get infected by COVID-19, that anyone in their family may get infected with the virus, and that the COVID-19 epidemic is a serious infection but around the same number believe that the local tertiary hospital will be able to handle COVID 19 pandemic in the community and that the government has provided enough information regarding COVID 19 (Table 2). The preventive practices of pregnant women were likewise found to be highly favorable as the mean practice score was 5.5 out of 6 (SD=1.0) although about 1 of 4 women (23.5%) stated that they would visit family or friends during

lockdown while 1 of every 6 women (16.3%) stated that will visit a COVID
19 positive patient (Table 2).

Knowledge	n	%
Symptoms:		
- Cough	126	31.5%
- Sore throat	119	29.8%
- Body pains	123	30.8%
- Fever	124	31.0%
- Difficulty of breathing	122	30.5%
- Tiredness	111	27.8%
The virus survives for days outside the body in the open air	305	76.3%
The virus survives for days outside the body on plastic surface	242	60.5%
Most people who get covid 19 become very ill	265	66.3%
Smokers who get covid 19 more likely to get ill	284	71.0%
You can have the virus without any symptoms	309	77.3%
Children get less ill from the virus than adults but not only elderly people die from COVID 19	195	48.8%
Mean Knowledge Score (SD)	5.8 (3.4)	
ATTITUDE		
I may get infected by COVID 19	351	87.8%
Anyone in my family may get infected	353	88.3%
COVID 19 Epidemic is a serious infection	344	86.0%
The hospital will be able to handle COVID 19 pandemic in the community	351	87.8%
The government has provided enough information regarding COVID 19	362	90.5%
Mean Attitude (SD)	4.4 (1.3)	
PRACTICE		
- cover mouth when sneezing or coughing	386	96.5%
- use face mask in public places	389	97.3%
- maintain social distance of 1-2 meters	386	96.5%
- wash or sanitize hands coming home from outside	387	96.8%
- will visit family or friends during lockdown	94	23.5%
- will visit a COVID 19 positive patient	65	16.3%
Mean Practice (SD)	5.5 (1.0)	

Table 2: Knowledge, attitude and practices of pregnant women on covid

Chi-square tests of association showed that knowledge, attitude and practice toward COVID-19 were not significantly associated with vaccine acceptability (p>0.05). As seen in the table, regardless of the status of the pregnant women's knowledge, attitude and practice toward COVID-19, majority chose to be vaccinated. (Table 3)

			Unvaccinated	Vaccinated	% (n = 400)	P
Good Knowledge	No (0 to 6)	n	106	171	277	0.363
		%	38.3%	61.7%	69.3%	
	Yes (7 to 12)	n	53	70	123	
		%	43.1%	56.9%	30.8%	
Good Attitude	No (0 to 3)	n	20	37	57	0.437
		%	35.1%	64.9%	14.3%	
	Yes (4 to 5)	n	139	204	343	
		%	40.5%	59.5%	85.8%	
Good Practice	No (0 to 5)	n	52	62	114	0.130
		%	45.6%	54.4%	28.5%	
	Yes (6)	n	107	179	286	
		%	37.4%	62.6%	71.5%	
	Total		159	241	400	
	%		39.75%	60.25%	100.00%	

p: p-value from chi-square test

Table 3: Association of knowledge, attitude and practice with covid-19 vaccine acceptability

Multiple logistic regression analysis was conducted to determine the significant predictors for vaccine acceptability (Table 4). All the variables that were found to be significantly associated with vaccine acceptability from the bivariate analysis were entered in the analysis. The final model showed that women who were either in the first or third trimester of pregnancy were much more likely to accept the COVID-19 vaccine as compared to those on second trimester of pregnancy (OR = 12.7 and 17.7, respectively). Moreover, participants above 30 years of age were almost twice likely (OR=1.9, CI: 1.2 – 3.2) to accept the vaccine, compared to those who were 30 years old or younger. Women who were married or living with a partner were likewise twice likely (OR=2.1, CI: 1.1 – 3.9) to accept the vaccine compared to

single-parent women. Furthermore, pregnant women who at least reached college-level education were twice likely (OR = 2.2, CI: 1.3 – 3.6) to accept the COVID-19 vaccine (Table 4). On the other hand, although employed or self-employed pregnant women were found to be 1.3 times more likely to have themselves vaccinated against COVID-19, the computed OR was not found to be statistically significant (p>0.05), implying that this association is true for the sample women in this study but not necessarily applicable to the general pregnant population. Similarly, a pregnant woman with a comorbidity was 3 times more likely to be vaccinated against COVID-19. This OR was not statistically significant however.

FACTORS	Odds Ratio	p	[95% Conf. Interval]	
			Lower limit	Upper limit
Being on 1st vs 2nd trimester	12.7	0.000	3.8	42.9
Being on 3rd vs 2nd trimester	17.7	0.000	6.7	46.8
Age (above 30)	1.9	0.009	1.2	3.2
Marital status (with married / unmarried partner)	2.1	0.018	1.1	3.9
Education (at least college level)	2.2	0.002	1.3	3.6
Occupation (employed / self-employed)	1.3	0.302	0.8	2.4
With comorbidity	3.0	0.119	0.8	11.9

Table 4: Factors associated with covid 19 vaccine acceptance based on logistic regression

Factors	n	%
Social Media	179	44.75
Barangay health worker / Health care provider	101	25.25
Relative	68	17
Friend	33	08.25
Newspaper	19	04.75

Table 5: Source of information on covid-19 vaccine

The major source of patient's information on Covid 19 disease and vaccination was obtained through social media accounting to almost half (44.7%) of the participants. Barangay Health Workers (BHW) and midwives ranked second as the source accounting to 25.2%. Followed by information

obtained from relative, friend, newspapers, 17.0 %, 8.0 % and 4.7 % respectively. These findings point out that combined efforts of both the LGU social media campaign and healthcare providers efforts have been major source of the knowledge of on Covid-19 vaccine of the participants.

	Vaccine acceptor	%	Non-Acceptor	%
Balic	2	0.82%	1	0.62%
Baretto	15	6.22%	8	5.03%
Calapacuan	6	2.48%	4	2.51%
Calapandayan	4	1.65%	2	1.25%
Castillejos	2	0.82%	1	0.62%
Cawag	1	0.41%	4	2.51%
Del Pilar	1	0.41%	5	3.14%
Dinalupihan	4	1.65%	8	5.03%
East Bajac	9	3.73%	14	8.08%
East Tapinac	4	1.65%	4	2.51%
Gordon Heights	19	7.88%	**18**	**11.32%**
Lower Kalaklan	8	3.31%	8	5.03%
Manganvaca Subic	10	4.14%	9	5.66%
Matain	1	0.41%	0	0
Morong Bataan	5	2.07%	1	0.62%
New Asinan	2	0.82%	5	3.14%
New Banicain	14	5.80%	1	0.62%
New Cabalan	**24**	**9.95%**	**22**	**13.8%**

Pag Asa	13	5.39%	6	3.77%
Palawig	1	0.41%	0	0
San Antonio	1	0.41%	1	0.62%
San Felipe	0	0	1	0.62%
San Marcelino	2	0.82%	1	0.62%
Sta Rita	**33**	**13.61%**	**16**	**10.06%**
Tabacuan	2	0.82%	1	0.62%
Tipo Bataan	1	0.41%	0	0
Upper Kalaklan	2	0.82%	1	0.62%
Wawandue	1	0.41%	0	0
West Bajac	4	1.65%	1	0.62%
West Tapinac	8	3.31%	4	2.51%

Table 6: Frequency of vaccine acceptors per barangay

Table 6 shows the distribution of the 241 vaccine acceptors per barangay. Majority reside in Sta Rita with 33 respondents, followed by New Banicain. Majority of the 159 non-acceptors came from New Cabalan and Gordon Heights.

Category	Population
1st dose (waiting for 2nd dose)	128
2nd dose	398
1st booster	59
Total	585

Table 7: Frequency of pregnant women covid vaccine acceptors as of june 14, 2022, olongapo city.

Conclusion:

From the study, about three of every five pregnant women (60.25%) accepted the COVID-19 Vaccine. The factors found to be significantly associated with vaccine acceptance include the following: trimester of pregnancy, age, marital status, level of education, employment status, and presence of comorbidities. Participants above 30 years of age were almost twice likely (OR=1.9, CI: 1.2 – 3.2) to accept the vaccine, compared to those who were 30 years old and younger. Women who were married or living with a partner were likewise 2.1 times more likely (OR=2.1, CI: 1.1 – 3.9) to accept the vaccine than single parent women. Pregnant women who at least reached college-level education were 2.2 times more likely (OR = 2.2, CI: 1.3 – 3.6) to the COVID-19 vaccine. Employed or self-employed pregnant women were found to be 1.3 times more likely to have themselves vaccinated, similarly, pregnant women with a comorbidity were found to be 3 times more likely to have themselves vaccinated. Odds Ratios of these 2 variables were not statistically significant however. Women who were either in the first or third trimester of pregnancy were much more likely to accept the COVID-19 vaccine as compared to those in their second trimester of pregnancy, OR = 12.7 and 17.7 respectively.

Recommendations:

The researcher may look into other variables such as knowledge and attitude of pregnant women on antenatal effects of the vaccine on the fetus and on themselves. Since the general knowledge and attitude about COVID-19 did not turn out to be significant determinants of vaccine acceptability for the study population. Additional studies comparing pregnant women with prenatal check-up (PNCU) versus without PNCU will prove to be valuable in assessing vaccine acceptability.

Study limitations:

The findings may be influenced by possible selection bias because there was no random selection of participants, and limited number of participants as well, limiting applicability of the associated factors to the general pregnant population. Another limitation is the bias of social desirability, as participants may have responded to questions, they deemed acceptable to the communities where they belong.

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