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Attitudes toward COVID-19 vaccination among pregnant and lactating women in SAMARICA District, Occidental Mindoro: A health belief model perspective

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ABSTRACT

COVID-19 vaccination is crucial for public health, yet hesitancy persists among specific populations, including pregnant and lactating women. This study aimed to determine the willingness of pregnant and lactating women in SAMARICA District, Occidental Mindoro, Philippines, to receive the COVID-19 vaccine and identify factors influencing their attitudes. This is an analytical cross-sectional study design using Health Belief Model survey interview. The total of 82 pregnant and lactating women from SAMARICA district in Occidental Mindoro were included through convenience sampling. Data were collected on demographics, perceived health status, vaccine information sources, and attitudes towards COVID-19 vaccination. Results shows that government trust (r=.492; p value=.000); perceived severity (r=.384; p value=.000); perceived benefits of COVID-19 vaccination (r=.522; p value=.000); perceived barriers of COVDI-19 vaccination (r=.364; p value=.001) were positively correlated with the respondents' cues to action. Rural residence was also associated with higher vaccination intention. While overall vaccination intention was high, targeted interventions are necessary to address remaining hesitancy among this vulnerable population. Strengthening health communication campaigns and addressing specific concerns regarding vaccine safety during pregnancy and lactation are crucial for improving COVID-19 vaccine uptake.

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1. INTRODUCTION

Pregnant and recently pregnant people are more likely to get severely ill from COVID-19 compared to non-pregnant people. Pregnant woman with COVDI-19 is more likely to experience preterm birth and be more likely to have other poor pregnancy outcomes (Diesel et al., 2022; Zambrano et al., 2020).

Globally, weekly COVID-19 cases rose with just over 3.8 million new cases reported and deaths increased 64,000. The COVID-19 situation saw an increase in cases across all regions, with the Western Pacific region, including the Philippines, experiencing the largest surge. The Western Pacific region reported a cumulative total of 712,417 cases and 13,159 deaths (World Health Organization, 2021).

The Philippines received its first COVID-19 vaccines on March 1, 2021, marking the beginning of the national vaccination campaign (Ayson & Reyes, 2021). Vaccination is one of the most important inventions in the history of humanity, having saved millions of lives and continuing to be a crucial safeguard for global health and well-being(World Health Organization, 2019a). However, the end of the pandemic remains elusive, as vaccine confidence plummeted in the country following the widespread media coverage of the Dengvaxia controversy (Alfonso et al., 2021).

The Health Belief Model (HBM) has been widely used to study vaccine hesitancy among pregnant and lactating women. Studies have found that HBM constructs, particularly perceived benefits and self-efficacy, significantly predict COVID-19 vaccine acceptance behavior in this population (Moghimi et al., 2023). Vaccine hesitancy rates among pregnant women ranged from 26% to 57%, with fear of adverse events and lack of knowledge being primary drivers (Gianfredi et al., 2023). Perceived susceptibility, benefits, barriers, and severity were statistically significant indicators of both influenza and COVID-19 vaccine uptake (Kansal et al., 2022). Factors such as young age, high educational level, and primigravidae status were associated with higher vaccine acceptance (Moghimi et al., 2023).

Nevertheless, despite the proven efficacy and availability of services, there remains a proportion of the population who refuse or delay vaccination (McKee & Bohannon, 2016). The reluctance or refusal to vaccinate, poses a significant threat to global health, potentially reversing progress made in combating vaccine-preventable diseases. This phenomenon, recognized by the World Health Organization in 2019 as one of the top ten threats to global health, stems from various factors, including complacency, inconvenience, and lack of confidence(World Health Organization, 2019b). Despite the demonstrated effectiveness of vaccination to reduce the morbidity and mortality of infectious diseases, immunization rates have been declining in many areas of the world (Amin et al., 2017). This has resulted to a high incidence of vaccine-preventable diseases (Lu et al., 2015). Vaccine refusal and delay have been associated with outbreaks of vaccine-preventable diseases (Phadke et al., 2016). As COVID-19 continues to spread around the world, more and more people are being motivated to take precautions to prevent its transmission, by staying home, observing physical distancing, and, most importantly, getting vaccinated. The last has been met with mixed reactions – many people are hesitant and skeptic to take the shot. It is documented that the success in a widespread vaccination is being challenged by individuals and groups who choose to delay or refuse vaccines (Paterson et al., 2016). The major reason for this behavior are the doubts about the safety of the vaccines, as influenced by bad experiences or by media (Dubé et al., 2014).

Despite limited studies on COVID vaccination among pregnant and lactating women, recommendations have been made for these special groups. Breastfeeding women who are part of a recommended vaccination group (e.g., healthcare workers) can receive the vaccine. Importantly, breastfeeding should not be interrupted before or after vaccination (Department of Health, 2021b). For pregnant women, vaccination can be considered, particularly after the first trimester, if recommended for their specific group. Generally, vaccines containing inactivated viruses are safe during pregnancy, while those with live viruses are typically not recommended (Marnach, 2017). Despite these recommendations, vaccine hesitancy among pregnant women persists. Factors contributing to this hesitancy include underestimating the risks of COVID-19 infection during pregnancy, concerns about potential harm to the unborn child, apprehension about existing health conditions, and fear of injection pain (Nalubega et al., 2021). There is a low to moderate COVID-19 vaccine acceptance among pregnant and lactating women (Goncu Ayhan et al., 2021)

Changes in the level of acceptance among pregnant and lactating women during a pandemic may be related to both individual and social or organizational factors. Increased perceived risk of infection, benefits of vaccines, government restrictions, penalties for not using masks, as well as intense communication of the threat from traditional and social media can have a significant impact on willingness to vaccinate (Al-Jayyousi et al., 2021; Kuciel et al., 2022). Similarly, Vaccine hesitancy among pregnant and lactating women is indeed prevalent, with studies reporting hesitancy rates ranging from 26% to 56% (Gianfredi et al., 2023). This study aimed to investigate the attitudes of pregnant and lactating women towards vaccination for COVID-19.

2. METHODOLOGY

2.1. Study Design

Analytical cross-sectional study design using a structured questionnaire. The study was conducted in SAMARICA district, composed of four municipalities (San Jose, Magsaysay, Rizal and Calintaan) in Occidental Mindoro from January 2021 to March 2021.

2.2. Population and Sample

The study population consisted of 82 pregnant and lactating women who accessed healthcare services in SAMARICA District, Occidental Mindoro. This sample size was determined by the accessible population within the district.

2.3. Research Instrument

The survey consisted of questions that assessed 1) demographic background, and self-perceived health status; and 2) perception of COVID-19 and COVID-19 vaccination.

Personal details, including age, marital status, and average monthly household income. Participants were also asked if they had any existing chronic diseases and to rate their overall health status. COVID-19 experience was assessed by inquiring whether participants had any family members, or any friends, neighbors, or colleagues with confirmed COVID-19.

Health Belief Model derived items were used to measure the participants' perception of COVID-19 and COVID-19 vaccination. The questions were probing perceived susceptibility to COVID-19 (three items), perceived severity of COVID-19 (three items), perceived benefits of a COVID-19 vaccine (two items), perceived barriers to getting a vaccination against COVID-19 (five items) and cues to action (two items). All the response options were 'strongly agree', agree, 'disagree' or 'strongly disagree' (Glanz et al., 2008).

2.4. Data Collection

The data collection technique was a survey interview using a questionnaire. Data was collected during scheduled prenatal and expanded program for immunization (EPI) clinic visits in the barangay health center. Informed consent was attained from the mothers before the researchers conducted the interview. Minimum health standards were observed in the health facility, such as social distancing, wearing masks and face shields, and hand hygiene.

2.5. Data Analysis

Data collected were encoded in Microsoft Excel and were analyzed with SPSS version 20 for descriptive and inferential statistics. Descriptive statistics used included percentages and frequencies for demographic profile and mean for vaccine hesitancy, personality traits and intention to vaccinate. Pearson's correlation coefficient was utilized to test the relationships between the samples' vaccine hesitancy to correlate with cues to action on vaccination of the respondents. Fisher's t-test was utilized to determine the significance of correlations. A p-value of equal to or less than .05 was considered statistically significant.

2.6. Ethical Considerations

The pregnant and lactating women were informed of the purpose of the study and the methods used and signed an informed consent statement. Participation was voluntary and could be terminated at any time during the conduct of the study. The participants were asked to answer all the questions honestly and were reassured about the anonymity and confidentiality of the information. The participants were informed that they could be provided with the results of the study once they expressed interest in knowing the results after the analysis and completion of the final draft. The conduct of the survey complied with the policy stated in Republic Act No. 10173, or the Data Privacy Act of 2012. Complete anonymity of the research participants was observed. Access to the data collected was limited only to the researchers. Unless required by law, the names of the participants would not be disclosed outside the research clinic. Names were available only to the following people or agencies: the principal investigator and staff; authorized representatives of the principal investigator; ethics committees; and health authorities.

3. RESULTS

3.1. Demographic Profile

A total of 82 complete responses were received. Table 1 shows the demographics of the study participants. Remarkably, the study participants had a higher representation of participants aged 18 to 29 years old (59.76%). A great majority of the respondents were in a relationship/married and cohabiting (81.71%) while their educational attainment is college graduate (37.8%). Most of the respondents belong to the poor income class (10.98%) with most of them having only 1 child (31.71%). Comparing health insurance, a higher proportion of participants have Philhealth (68.29) than those who do not have health insurance (31.71). A higher proportion of participants from rural (62.2%) than urban (37.8%) residences responded to the survey [Table 1].

Table 1. Demographic profile of pregnant and lactating women.

Demographic Profile	Intention			Total n(%)
	Has Intent n(%)	Neutral n(%)	No Intent n(%)	
Age				
18-29	21 (25.61)	19 (23.17)	9 (10.98)	49 (59.76)
30-39	14 (17.07)	4 (4.88)	4 (4.88)	22 (26.83)
40-49	7 (8.54)	3 (3.66)	1 (1.22)	11 (13.41)
Relatioship status				
Single, never married	1 (1.22)	6 (7.32)	1 (1.22)	12 (14.63)
In a relationship/ married but living apart or separated	1 (1.22)	1 (1.22)	1 (1.22)	3 (3.66)
In a relationship/married or cohabiting	12 (14.63)	19 (23.17)	12 (14.63)	67 (81.71)
Educational attainment				
Highschool undergraduate	0	1 (1.22)	0	1 (1.22)
Highschool graduate	10 (12.2)	9 (10.98)	4 (4.88)	23 (28.05)
Vocational	7 (8.54)	10 (12.2)	4 (4.88)	21 (25.61)
College undergraduate	3 (3.66)	1 (1.22)	1 (1.22)	5 (6.1)
College graduate	21 (25.61)	5 (6.1)	5 (6.1)	31 (37.8)
Masteral/ Doctoral	1 (1.22)	0	0	1 (1.22)
Income class				
Poor	21 (25.61)	19 (23.17)	21 (25.61)	9 (10.98)
Low income (but not poor)	9 (10.98)	4 (4.88)	9 (10.98)	3 (3.66)
Lower middle income	6 (7.32)	1 (1.22)	6 (7.32)	0
Middle middle income	2 (2.44)	0	2 (2.44)	1 (1.22)
Upper middle	2 (2.44)	0	2 (2.44)	0
Upper income (but not rich)	0	0	0	0
Rich	2 (2.44)	2 (2.44)	2 (2.44)	1 (1.22)
Health Insurance				
None	11 (13.41)	11 (13.41)	4 (4.88)	26 (31.71)
Philhealth	31 (37.8)	15 (18.29)	10 (12.2)	56 (68.29)
Number of child				
0	5 (6.1)	3 (3.66)	1 (1.22)	9 (10.98)
1	14 (17.07)	7 (8.54)	5 (6.1)	26 (31.71)
2	13 (15.85)	9 (10.98)	3 (3.66)	25 (30.49)
3	5 (6.1)	3 (3.66)	2 (2.44)	10 (12.2)
4	5 (6.1)	4 (4.88)	3 (3.66)	12 (14.63)
Residence				
Urban	2 (2.44)	10(12.2)	2 (2.44)	31 (37.8)
Rural	12 (14.63)	16 (19.51)	12 (14.63)	51 (62.2)

3.2. Sources of COVID-19 Vaccine Information

Most of the participants responded that the health agencies (48.78%) are the source of information for COVID-19 pandemic and vaccination of the respondents [Table 2].

Table 2. Sources of COVID-19 vaccine information.

Source of information	Intention			Total n(%)
	Has Intent n(%)	Neutral n(%)	No Intent n(%)	
Social media	19 (23.17)	11 (13.41)	5 (6.1)	35 (42.68)
Mass media	20 (24.39)	13 (15.58)	5 (6.1)	38 (46.34)
Government	12 (14.63)	4 (4.88)	3 (3.66)	18 (21.95)
Health agencies	26 (31.71)	9 (10.98)	26 (31.71)	40 (48.78)
Scientists	1 (1.22)	0	0	1 (1.22)
Pharmaceutical companies	2 (2.44)	0	1 (1.22)	3 (3.66)
Healthcare providers	20 (24.39)	10 (12.2)	6 (7.32)	35 (42.68)
My personal social networks	10 (12.2)	8 9.76)	5 (6.1)	23 (28.05)

Accepted multiple response.

3.3. Perceived Health Status

Most of the participants are in their 3rd trimester of pregnancy (31.71%) while there are breastfeeding mothers of more than 6 months (17.07%). There are few pregnant and lactating women with comorbidity (23.17%) compared to non-comorbid (76.83%). The participants perceived their overall health status as neutral (48.78%) [Table 3].

Table 3. Perceived health status.

Perceived health status	Intention for Vaccination			Total n(%)
	Has Intent n(%)	Neutral n(%)	No Intent n(%)	
Pregnancy				
Not pregnant	14 (17.07)	4 (4.88)	8 (9.76)	26 (31.71)
1st trimester	9 (10.98)	4 (4.88)	3 (3.66)	16 (19.51)
2nd trimester	5 (6.1)	8 (9.76)	1 (1.22)	14 (17.07)
3rd trimester	14 (17.07)	10 (12.2)	2 (2.44)	26 (31.71)
Breastfeeding				
Not breastfeeding	28 (34.15)	22 (26.83)	6 (7.32)	56 (68.29)
6 weeks below	4 (4.88)	1 (1.22)	0	5 (6.1)
6 weeks to 6 months	6 (7.32)	0	1 (1.22)	7 (8.54)
more than 6 months	4 (4.88)	3 (3.66)	7 (8.54)	14 (17.07)
Do you have any medical condition diagnosed by a medical doctor?				
No	34 (41.46)	18 (21.95)	11 (13.41)	63 (76.83)
Yes	8 (9.76)	8 (9.76)	3 (3.66)	19 (23.17)
How do you rate your overall health				
Very Poor	1 (1.22)	0	0	1 (1.22)
Neutral	16 (19.51)	13 (15.85)	11(13.41)	40 (48.78)
Good	12 (14.63)	5 (6.10	1 (1.22)	18 (21.95)
Very Good	13 (15.85)	8 (9.76)	2 (2.44)	23 (28.05)

3.4. Attitude towads COVID-19 Vaccine

The participants had neutral perceptions of susceptibility. The majority agreed and were worried about the likelihood of getting COVID-19 (3.44±1.316). The participants had high perceptions of the severity of COVID-19 on its serious complications (4.04±1.138). High perceptions of the benefits of COVID-19 vaccination were reported and believed that vaccination is a good idea which perceived fewer worries about catching COVID-19 (4.04±1.059). The perceived barriers construct concerns about the COVID-19 vaccine being faulty/fake (4.05±1.088). Many of the participants reported that they would only receive the COVID-19 vaccine if given adequate information (3.09±1.165). Most of the respondent's attitude towards COVID-19 and the COVID-19 vaccine was neutral to high perceptions [Table 4].

Table 4. Attitude towads COVID-19 vaccine.

Attitudes		Mean	Standard Deviation
Perceived susceptibility of contracting COVID-19			
My chance of getting COVID-19 in the next few months is great.		2.93	1.39
I am worried about the likelihood of getting COVID.		3.44	1.32
Getting COVID-19 is currently a possibility for me.		3.01	1.44
	Factor mean	**3.12**	**1.19**
Perceived Severity			
Complications from COVID-19 are serious.		4.04	1.14
I will be very sick if I get COVID-19.		3.61	1.22
I am afraid of getting COVID-19.		4.02	1.11
	Factor mean	**3.89**	**0.92**
Perceived benefits of COVID-19 vaccination			
Vaccination is a good idea because I feel less worried about catching COVID-19.		4.04	1.06
Vaccination decreases my chance of getting COVID-19 or its complications.		3.71	1.16
	Factor mean	**3.87**	**0.96**
Perceived barriers of COVID-19 vaccination			
Worry the possible side-effects of COVID-19 vaccination would interfere with my usual activities.		3.76	1.01
I am concern about the efficacy of the COVID-19 vaccination.		3.55	1.11
I am concern about the safety of the COVID-19 vaccination.		3.51	1.19
I am concern of my affordability (high cost of the vaccine) of getting the COVID-19 vaccination.		3.15	1.31
I am concern of the faulty/fake COVID-19 vaccine.		4.05	1.09
	Factor mean	**3.60**	**0.84**
Cues to action			
I will only take the COVID-19 vaccine if I was given adequate information about it.		3.98	1.17
I will only take the COVID-19 vaccine if the vaccine is taken by many in the public.		3.57	1.16
If my employer recommends vaccine, i will take it.		3.59	1.19
	Factor mean	**3.71**	**1.02**

Scale: 1.00-1.79 Strongly disagree; 1.80-2.59 Disagree; 2.60-3.39 Neutral; 3.40-4.19 Agree 4.20-5.00 Strongly agree.

3.5. The Relationship between Vaccine Hesitancy and the Cues to Action.

This shows that government trust (r=.492; p-value <.001); perceived severity (r=.384; p-value <.001); perceived benefits of COVID-19 vaccination (r=.522; p-value <.001); perceived barriers of COVID-19 vaccination (r=.364; p value=.001) is positively correlated with the respondents' cues to action [Table 5].

Table 5. The relationship between vaccine hesitancy and the cues to action.

Health Belief	Cues to Action	
	R	p-value
Perceived health status	.206	.063
Government trust	.492	<.001**
Perceived susceptibility of contracting COVID-19	.170	.126
Perceived severity	.384	<.001**
Perceived benefits of COVID-19 vaccination	.522	<.001**
Perceived barriers of COVID-19 vaccination	.364	.001**

***Correlation is significant at the 0.01 level.*

4. DISCUSSION

In the age group of 18-29, most of them have an intent to get the vaccine (25.61%). Participant responses to whether they would take a COVID-19 vaccine were mixed. Some would get the vaccine right away, while other participants said they would not take a COVID-19 vaccine feeling that COVID-19 would not affect their health or the health of their family members (Lang et al., 2021). But according to Piltch-Loeb et al., (2022) younger ages are more likely hesitant to get the vaccine compared to older ages because most of the vaccinated persons were older groups.

Married/cohabiting respondents with children were more likely to indicate that the vaccine was effective, compared to those without children or not in a relationship (Konopińska et al., 2021; Thorneloe et al., 2020). Adults with lower educational attainment, with lower income, and without health insurance were of most likely to report lack of intent to receive the COVID-19 vaccine (Nguyen et al., 2021). Another study supported the results, states that as years of education increases, so does reported acceptance of the COVID-19 vaccine. Unemployed participants reported a lower acceptance rate of a COVID-19 vaccine. It demonstrates that low-income communities, which are disproportionately impacted by COVID-19, may be more susceptible to continued outbreaks, even if a vaccine is available (Malik et al., 2020). Additionally, age less than 24 years, living in urban areas, tertiary education, students, single marital status, and family income were significantly associated with vaccine acceptance of COVID19 vaccination respondents (Marzo et al., 2022). On the residence of the participants, COVID-19 vaccination coverage was lower overall, among men and women in rural compared with urban counties COVID-19 (Murthy et al., 2021). But according to the Department of Health, given the limited global supply of vaccines for COVID-19, the Inter-Agency Task Force for the Management of Emerging Infectious Diseases (IATF) has adopted the prioritization framework and criteria for prioritizing population most-at risk regardless of other factors (Department of Health, 2021a).

On the contrary from the result of the study, Alzoubi et al., (2020) that social media was the most common source of information. Similarly, Olaimat et al., (2020), stated that the most common source of the information about COVID-19 was the internet and social media followed by mass media. But the respondents chosen health agencies and health workers as their source of information which relates to the guidelines of the World Health Organization (2020), states that health workers should provide or reinforce accurate infection prevention and control and public health information, including too concerned people who have neither symptoms nor risk.

Contrarily, participants in their first trimester expressed greater interest in receiving the COVID-19 vaccination compared with participants in their second and third trimesters (Goncu Ayhan et al., 2021). The participant's action would be from the advice from the Department of Health, (2021b) which states that a pregnant woman should consider to get vaccinated after the first trimester of pregnancy. Generally, breastfeeding mothers has an intent to get the vaccine but Mayo & Monfort (2021), demanded the right of the breastfeeding mothers the updated information and the right to choose whether to be vaccinated or not until there is evidence from clinical trials. Kong et al., (2020), pregnant women were more likely to receive the vaccine because their healthcare providers had recommended it. Reno et al., (2021), found that persons who had no comorbidities had the highest level of hesitancy. On the other note, almost one in five respondents with comorbid conditions reported COVID-19 vaccine hesitancy (Tsai et al., 2021). Vaccine hesitancy is present in almost 60% of persons with comorbidity, and the most common reasons are the fear of the vaccine impacting the cancer therapy, fear of side-effects, and lack of information (Noronha et al., 2021). Despite most of the participants perceived their health status as neutral, they positively respond that they have an

intention to get the vaccine. Accepting a vaccine is not an easy task when people are barraged by conflicting messages about its potential safety and effectiveness and people can move up and down the continuum due to a variety of influences (Tibbetts, 2020).

The participants perceived susceptibility, severity, benefits barriers and cues to action may influence COVID-19 vaccine acceptance. HBM was used widely as the theoretical framework to explain how the acceptance of changes in health-related behaviors of individuals is mainly due to their perceptions (Huynh et al., 2021). Similar with the results, the majority view was that there was a great chance of getting COVID-19 in the next few months (L. P. Wong et al., 2020). But Lin et al., (2020) found that the participants had low perceptions of susceptibility. The majority disagreed that there was a great chance of getting COVID-19 in the next few months were also not worried about the likelihood of getting COVID-19 and disagreed that it was currently possible that they would get COVID-19. According to Iorfa et al., (2020), knowledge had a significant influence on precautionary behavior. It is logical to expect that when individuals are aware of threats, they will adopt reasonable behaviors that may avert the threat from causing harm.

The majority also had high perceptions of severity of the COVID-19 infection. High perceptions of benefits and perceived barriers were also reported. Under the perceived barriers construct, concern about affordability and the COVID-19 vaccine being halal (kosher) was. Although nearly all the participants reported that they will only take the COVID-19 vaccine if given adequate information (L. P. Wong et al., 2020).

Governments, public health officials and advocacy groups must be prepared to address hesitancy and build vaccine literacy so that the public will accept immunization when appropriate. Anti-vaccination activists are already campaigning in multiple countries against the need for a vaccine, with some denying the existence of COVID-19 altogether (Enserink, 2020). Respondents who said that they trusted their government were more likely to accept a vaccine than those who said that they did not. Moreover, if an individual trusted their government, they were more likely to respond positively to their employer's vaccine recommendation than someone who did not (Lazarus et al., 2020). Higher trust in government regarding COVID-19 control was significantly associated with higher adoption of health behaviors. This is in line with several previous studies where higher levels of trust in government are related to more support for public welfare policies and adherence to public health interventions (Hetherington & Husser, 2012). Investigating the connection among threat perceptions and willingness to take a potential vaccine towards COVID-19, discovered that respondents who rated the disorder better on a threat belief index (such as numerous threat measures) extra frequently pronounced that they might receive a vaccine towards COVID-19 (Malik et al., 2020). A key determinant in people's vaccination choices is the danger they associate with the disease the vaccine protects against (Thomson et al., 2016). COVID-19 risk perception, and perceived vaccine benefits, and barriers (Al-Ashwal et al., 2020) were significant predictors of intention (Al-Mistarehi et al., 2021). Most members are planning to get the COVID-19 immunization. Critical indicators of a positive purpose to require the COVID-19 immunization incorporate high-perceived benefits and lower seen barriers to accepting the immunization, and higher seen susceptibility to contamination. Interventions targeting HBM concepts could be effective in increasing the uptake of the vaccine (M. C. S. Wong et al., 2021).

5. CONCLUSION

This study explored the attitudes of pregnant and lactating women in SAMARICA district, Occidental Mindoro towards COVID-19 vaccination. The majority of respondents expressed a positive attitude towards vaccination, which was reflected in their high perceived benefits of vaccination and moderate perceived severity of COVID-19. While a higher proportion of participants resided in rural areas, further research is needed to determine if this translates to a higher likelihood of vaccination uptake. This study did not find a statistically significant relationship between demographic factors such as age, relationship status, education, income, number of children, and intention to vaccinate. However, it showed that women living in the rural area are more likely to get the vaccine. Perceived severity, perceived benefits, and lower perceived barriers, along with strong cues to action, emerged as significant predictors of a positive attitude toward vaccination. While this study did not specifically investigate differences in vaccine attitudes across trimesters or breastfeeding status, further research is recommended to explore this area. Finally, the study confirmed the importance of trust in government and health authorities as a factor influencing cues to action.

Public health campaigns should emphasize the benefits of COVID-19 vaccination for pregnant and lactating women, addressing common concerns about safety and efficacy. These campaigns should leverage trusted sources of information, such as health workers and local health agencies, given their prominence as information sources among the study participants. Interventions should focus on reducing perceived barriers to vaccination. Efforts to enhance trust in government and health authorities are essential for promoting

vaccine acceptance. Qualitative research could be valuable in exploring the reasons behind vaccine hesitancy and understanding the specific concerns of pregnant and lactating women.

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REFERENCES

Al-Ashwal, F. Y., Kubas, M., Zawiah, M., Bitar, A. N., Saeed, R. M., Sulaiman, S. A. S., Khan, A. H., & Ghadzi, S. M. S. (2020). Healthcare workers' knowledge, preparedness, counselling practices, and perceived barriers to confront COVID-19: A cross-sectional study from a war-torn country, Yemen. PLOS ONE, 15(12), e0243962. https://doi.org/10.1371/JOURNAL.PONE.0243962

Al-Jayyousi, G. F., Sherbash, M. A. M., Ali, L. A. M., El-Heneidy, A., Alhussaini, N. W. Z., Elhassan, M. E. A., & Nazzal, M. A. (2021). Factors Influencing Public Attitudes towards COVID-19 Vaccination: A Scoping Review Informed by the Socio-Ecological Model. Vaccines, 9(6). https://doi.org/10.3390/VACCINES9060548

Al-Mistarehi, A. H., Kheirallah, K. A., Yassin, A., Alomari, S., Aledrisi, M. K., Ata, E. M. B., Hammad, N. H., Khanfar, A. N., Ibnian, A. M., & Khassawneh, B. Y. (2021). Determinants of the willingness of the general population to get vaccinated against COVID-19 in a developing country. Clinical and Experimental Vaccine Research, 10(2), 171–182. https://doi.org/10.7774/CEVR.2021.10.2.171

Alzoubi, H., Alnawaiseh, N., Al-Mnayyis, A., Abu-Lubad, M., Aqel, A., & Al-Shagahin, H. (2020). Covid-19 - Knowledge, attitude and practice among medical and non-medical university students in Jordan. Journal of Pure and Applied Microbiology, 14(1), 17–24. https://doi.org/10.22207/JPAM.14.1.04

Amin, A. B., Bednarczyk, R. A., Ray, C. E., Melchiori, K. J., Graham, J., Huntsinger, J. R., & Omer, S. B. (2017). Association of moral values with vaccine hesitancy. Nature Human Behaviour, 1(12), 873–880. https://doi.org/10.1038/S41562-017-0256-5

Ayson, M. E., & Reyes, lara G. (2021). The Philippines 2021: Populist legacy and looming uncertainties - Asia Maior - An Italian think tank on Asia. Asia Maior. https://www.asiamaior.org/the-journal/15-asia-maior-vol-xxxii-2021/the-philippines-2021-populist-legacy-and-looming-uncertainties.html

Alfonso, C., Dayrit, M., Mendoza, R. & Ong, M. (2021). From Dengvaxia to Sinovac: Vaccine Hesitancy in the Philippines – The Diplomat. The Diplomat. https://thediplomat.com/2021/03/from-dengvaxia-to-sinovac-vaccine-hesitancy-in-the-philippines/

Department of Health. (2021a). IATF Adopts COVID-19 Vaccination Priority Framework Amid Limited Vaccine Supply. Department of Health Website. https://doh.gov.ph/doh-press-release/IATF-ADOPTS-COVID-19-VACCINATION-PRIORITY-FRAMEWORK-AMID-LIMITED-VACCINE-SUPPLY

Department of Health. (2021b, March 30). Can pregnant women get the COVID-19 vaccine? | Department of Health website. Department of Health. https://doh.gov.ph/node/28465

Diesel, J., Sterrett, N., Dasgupta, S., Kriss, J. L., Barry, V., Esschert, K. Vanden, Whiteman, A., Cadwell, B. L., Weller, D., Qualters, J. R., Harris, L. T., Bhatt, A., Williams, C., Fox, L. A. M., Delman, D. M., Black, C. L., & Barbour, K. E. (2022). COVID-19 Vaccination Coverage Among Adults — United States, December 14, 2020–May 22, 2021. MMWR. Morbidity and Mortality Weekly Report, 70(25), 922–927. https://doi.org/10.15585/MMWR.MM7025E1

Dubé, E., Gagnon, D., Nickels, E., Jeram, S., & Schuster, M. (2014). Mapping vaccine hesitancy--country-specific characteristics of a global phenomenon. Vaccine, 32(49), 6649–6654. https://doi.org/10.1016/J.VACCINE.2014.09.039

Enserink, M. (2020). Fact-checking Judy Mikovits, the controversial virologist attacking Anthony Fauci in a viral conspiracy video. Science. https://doi.org/10.1126/SCIENCE.ABC7103

Gianfredi, V., Stefanizzi, P., Berti, A., D'Amico, M., De Lorenzo, V., Lorenzo, A. Di, Moscara, L., & Castaldi, S. (2023). A Systematic Review of Population-Based Studies Assessing Knowledge, Attitudes, Acceptance, and Hesitancy of Pregnant and Breastfeeding Women towards the COVID-19 Vaccine. Vaccines, 11(8). https://doi.org/10.3390/VACCINES11081289

Glanz, K., Rimer, B., & Viswanath, K. (2008). Health Behavior and Health Education: Theory, Research, and Practice. In John Wiley & Sons, Inc. https://iums.ac.ir/files/hshe-soh/files/beeduhe_0787996149(1).pdf

Goncu Ayhan, S., Oluklu, D., Atalay, A., Menekse Beser, D., Tanacan, A., Moraloglu Tekin, O., & Sahin, D. (2021). COVID-19 vaccine acceptance in pregnant women. International Journal of Gynecology & Obstetrics, 154(2). https://doi.org/10.1002/IJGO.13713

Hetherington, M. J., & Husser, J. A. (2012). How Trust Matters: The Changing Political Relevance of Political Trust. American Journal of Political Science, 56(2), 312–325. https://doi.org/10.1111/J.1540-5907.2011.00548.X

Huynh, G., Tran, T. T., Nguyen, H. T. N., & Pham, L. A. (2021). Perceived susceptibility, severity, and reinfection of COVID-19 may influence vaccine acceptance-Authors' reply. Asian Pacific Journal of Tropical Medicine, 14(5), 239. https://doi.org/10.4103/1995-7645.316400

Iorfa, S. K., Ottu, I. F. A., Oguntayo, R., Ayandele, O., Kolawole, S. O., Gandi, J. C., Dangiwa, A. L., & Olapegba, P. O. (2020). COVID-19 Knowledge, Risk Perception, and Precautionary Behavior Among Nigerians: A Moderated Mediation Approach. Frontiers in Psychology, 11. https://doi.org/10.3389/FPSYG.2020.566773

Kansal, N., Weaver, K., Vasudevan, L., & Hughes, B. (2022). Evaluating Influenza and COVID-19 Vaccine Hesitancy Among Pregnant Women Using the Health Belief Model. American Journal of Obstetrics and Gynecology, 226(2), 314. https://doi.org/10.1016/j.ajog.2021.11.1319

Kong, K. L., Chu, S., & Giles, M. L. (2020). Factors influencing the uptake of influenza vaccine vary among different groups in the hard-to-reach population. Australian and New Zealand Journal of Public Health, 44(2), 163–168. https://doi.org/10.1111/1753-6405.12964

Konopińska, J., Obuchowska, I., Lisowski, Ł., Dub, N., Kozera, M., & Rękas, M. (2021). Intention to Get COVID-19 Vaccinations among Ophthalmology Residents in Poland: A Cross-Sectional Survey. Vaccines, 9(4). https://doi.org/10.3390/VACCINES9040371

Kuciel, N., Mazurek, J., Hap, K., Marciniak, D., Biernat, K., & Sutkowska, E. (2022). COVID-19 Vaccine Acceptance in Pregnant and Lactating Women and Mothers of Young Children in Poland. International Journal of Women's Health, 14, 415–424. https://doi.org/10.2147/IJWH.S348652

Lang, R., Benham, J. L., Atabati, O., Hollis, A., Tombe, T., Shaffer, B., Burns, K. K., MacKean, G., Léveillé, T., McCormack, B., Sheikh, H., Fullerton, M. M., Tang, T., Boucher, J. C., Constantinescu, C., Mourali, M., Manns, B. J., Marshall, D. A., Hu, J., & Oxoby, R. J. (2021). Attitudes, behaviours and barriers to public health measures for COVID-19: a survey to inform public health messaging. BMC Public Health, 21(1), 1–15. https://doi.org/10.1186/S12889-021-10790-0/TABLES/3

Lazarus, J. V., Ratzan, S. C., Palayew, A., Gostin, L. O., Larson, H. J., Rabin, K., Kimball, S., & El-Mohandes, A. (2020). A global survey of potential acceptance of a COVID-19 vaccine. Nature Medicine 2020 27:2, 27(2), 225–228. https://doi.org/10.1038/s41591-020-1124-9

Lin, Y., Hu, Z., Zhao, Q., Alias, H., Danaee, M., & Wong, L. P. (2020). Understanding COVID-19 vaccine demand and hesitancy: A nationwide online survey in China. PLOS Neglected Tropical Diseases, 14(12), e0008961. https://doi.org/10.1371/JOURNAL.PNTD.0008961

Lu, P. J., O'Halloran, A., & Williams, W. W. (2015). Impact of health insurance status on vaccination coverage among adult populations. American Journal of Preventive Medicine, 48(6), 647. https://doi.org/10.1016/J.AMEPRE.2014.12.008

Malik, A. A., McFadden, S. A. M., Elharake, J., & Omer, S. B. (2020). Determinants of COVID-19 vaccine acceptance in the US. EClinicalMedicine, 26. https://doi.org/10.1016/j.eclinm.2020.100495

Marnach, M. (2017). Update on Immunization and Pregnancy: Tetanus, Diphtheria, and Pertussis Vaccination. Obstetrics and Gynecology, 130(3), e153–e157. https://doi.org/10.1097/AOG.0000000000002301

Marzo, R. R., Ahmad, A., Abid, K., Khatiwada, A. P., Ahmed, A., Kyaw, T. M., Abidin, I. B. Z., Srithar, M., Sinnathamby, S., Sarvasundram, A. P., & Shrestha, S. (2022). Factors influencing the acceptability of COVID-19 vaccination: A cross-sectional study from Malaysia. Vacunas, 23, S33–S40. https://doi.org/10.1016/J.VACUN.2021.07.007

Mayo, S., & Monfort, S. (2021). Letter to the Editor: Breastfeeding and COVID-19 Vaccine: Yes We Can. Https://Doi.Org/10.1177/08903344211004443, 37(2), 275–276. https://doi.org/10.1177/08903344211004443

McKee, C., & Bohannon, K. (2016). Exploring the Reasons Behind Parental Refusal of Vaccines. The Journal of Pediatric Pharmacology and Therapeutics : JPPT, 21(2), 104. https://doi.org/10.5863/1551-6776-21.2.104

Moghimi, S., Seraji, M., & Arab Borzu, Z. (2023). Predicting the Factors Related to the Acceptance of COVID-19 Vaccination by Pregnant and Lactating Women Referring to Comprehensive Health Service Centers in Zahedan, Iran, Using the Health Belief Model. Iran Journal of Nursing, 36(144), 386–397. https://doi.org/10.32598/IJN.36.144.3323.2

Murthy, B. P., Sterrett, N., Weller, D., Zell, E., Reynolds, L., Toblin, R. L., Murthy, N., Kriss, J., Rose, C., Cadwell, B., Wang, A., Ritchey, M. D., Gibbs-Scharf, L., Qualters, J. R., Shaw, L., Brookmeyer, K. A., Clayton, H., Eke, P., Adams, L., … Harris, L. T. Q. (2021). Disparities in COVID-19 Vaccination Coverage Between Urban and Rural Counties - United States, December 14, 2020-April 10, 2021. MMWR. Morbidity and Mortality Weekly Report, 70(20), 759–764. https://doi.org/10.15585/MMWR.MM7020E3

Nalubega, P., Karafillakis, E., Atuhaire, L., Akite, P., Zalwango, F., Chantler, T., Cochet, M., Seeley, J., & Le Doare, K. (2021). Maternal Vaccination in Uganda: Exploring Pregnant Women, Community Leaders and Healthcare Workers' Perceptions. Vaccines, 9(6). https://doi.org/10.3390/VACCINES9060552

Nguyen, K. H., Srivastav, A., Razzaghi, H., Williams, W., Lindley, M. C., Jorgensen, C., Abad, N., & Singleton, J. A. (2021). COVID-19 vaccination intent, perceptions, and reasons for not vaccinating among groups prioritized for early vaccination — United States, September and December 2020. American Journal of Transplantation, 21(4), 1650–1656. https://doi.org/10.1111/ajt.16560

Noronha, V., Abraham, G., Bondili, S., Rajpurohit, A., Menon, R., Gattani, S., Trikha, M., Tudu, R., Kota, K., Singh, A., Elamarthi, P., Panda, G., Rai, R., Krishna, M., Chinthala, S., Shah, M., Shah, D., Tiwari, A., Vora, D., … Prabhash, K. (2021). COVID-19 vaccine uptake and vaccine hesitancy in Indian patients with cancer: A questionnaire-based survey. Cancer Research, Statistics, and Treatment, 4(2), 211–218. https://doi.org/10.4103/CRST.CRST_138_21

Olaimat, A. N., Aolymat, I., Shahbaz, H. M., & Holley, R. A. (2020). Knowledge and Information Sources About COVID-19 Among University Students in Jordan: A Cross-Sectional Study. Frontiers in Public Health, 8, 254. https://doi.org/10.3389/FPUBH.2020.00254/BIBTEX

Paterson, P., Meurice, F., Stanberry, L. R., Glismann, S., Rosenthal, S. L., & Larson, H. J. (2016). Vaccine hesitancy and healthcare providers. Vaccine, 34(52), 6700–6706. https://doi.org/10.1016/J.VACCINE.2016.10.042

Phadke, V. K., Bednarczyk, R. A., Salmon, D. A., & Omer, S. B. (2016). Association Between Vaccine Refusal and Vaccine-Preventable Diseases in the United States: A Review of Measles and Pertussis. JAMA, 315(11), 1149–1158. https://doi.org/10.1001/JAMA.2016.1353

Piltch-Loeb, R., Silver, D. R., Kim, Y., Norris, H., McNeill, E., & Abramson, D. M. (2022). Determinants of the COVID-19 vaccine hesitancy spectrum. PLOS ONE, 17(6), e0267734. https://doi.org/10.1371/JOURNAL.PONE.0267734

Reno, C., Maietti, E., Fantini, M. P., Savoia, E., Manzoli, L., Montalti, M., & Gori, D. (2021). Enhancing covid-19 vaccines acceptance: results from a survey on vaccine hesitancy in northern Italy. Vaccines, 9(4), 378. https://doi.org/10.3390/VACCINES9040378/S1

Thomson, A., Robinson, K., & Vallée-Tourangeau, G. (2016). The 5As: A practical taxonomy for the determinants of vaccine uptake. Vaccine, 34(8), 1018–1024. https://doi.org/10.1016/J.VACCINE.2015.11.065

Thorneloe, R., Wilcockson, H., Lamb, M., Jordan, C., & Arden, M. (2020). Willingness to receive a COVID-19 vaccine among adults at high-risk of COVID-19: a UK-wide survey. PsyArXiv Preprints. https://doi.org/10.31234/osf.io/fs9wk

Tibbetts, J. (2020). Will a COVID Vaccine Be Accepted? Social, behavioral scientists needed to advance effective public health messaging. American Institute of Biological Sciences. https://doi.org/https://doi.org/10.1093/biosci/biaa133

Tsai, R., Hervey, J., Hoffman, K. D., Wood, J., Novack, J., Johnson, J., Deighton, D. C., Loew, B., & Goldberg, S. L. (2021). COVID-19 vaccine hesitancy among individuals with cancer, autoimmune diseases, and other serious comorbid conditions. MedRxiv, 2021.04.06.21254014. https://doi.org/10.1101/2021.04.06.21254014

Wong, L. P., Alias, H., Wong, P. F., Lee, H. Y., & AbuBakar, S. (2020). The use of the health belief model to assess predictors of intent to receive the COVID-19 vaccine and willingness to pay. Human Vaccines & Immunotherapeutics, 16(9), 2204–2214. https://doi.org/10.1080/21645515.2020.1790279

Wong, M. C. S., Wong, E. L. Y., Huang, J., Cheung, A. W. L., Law, K., Chong, M. K. C., Ng, R. W. Y., Lai, C. K. C., Boon, S. S., Lau, J. T. F., Chen, Z., & Chan, P. K. S. (2021). Acceptance of the COVID-19 vaccine based on the health belief model: A population-based survey in Hong Kong. Vaccine, 39(7), 1148–1156. https://doi.org/10.1016/J.VACCINE.2020.12.083

World Health Organization. (2019a). Immunization. World Health Organization. https://www.who.int/newsroom/facts-in-pictures/detail/immunization

World Health Organization. (2019b). Ten threats to global health in 2019. World Health Organization. https://www.who.int/news-room/spotlight/ten-threats-to-global-health-in-2019

World Health Organization. (2020). WHO calls for healthy, safe and decent working conditions for all health workers, amidst COVID-19 pandemic. World Health Organization. https://www.who.int/news/item/28-04-2020-who-calls-for-healthy-safe-and-decent-working-conditions-for-all-health-workers-amidst-covid-19-pandemic

World Health Organization. (2021). Weekly epidemiological update on COVID-19 - 30 March 2021. World Health Organization. https://www.who.int/publications/m/item/weekly-epidemiological-update-on-covid-19---31-march-2021

Zambrano, L. D., Ellington, S., Strid, P., Galang, R. R., Oduyebo, T., Tong, V. T., Woodworth, K. R., Nahabedian, J. F., Azziz-Baumgartner, E., Gilboa, S. M., Meaney-Delman, D., Akosa, A., Bennett, C., Burkel, V., Chang, D., Delaney, A., Fox, C., Griffin, I., Hsia, J., … Zapata, L. (2020). Update: Characteristics of Symptomatic Women of Reproductive Age with Laboratory-Confirmed SARS-CoV-2 Infection by Pregnancy Status — United States, January 22–October 3, 2020. MMWR. Morbidity and Mortality Weekly Report, 69(44), 1641–1647. https://doi.org/10.15585/MMWR.MM6944E3

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