Long Paper

Knowledge, Attitudes, and Practices of Pregnant Women in the Prevention of COVID-19

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Abstract

　　COVID-19, a new respiratory infection, emerged as a global pandemic in 2020. Pregnant women are immunocompromised, making them vulnerable to the disease, and there is no exact treatment yet. It is therefore essential to follow the control measures in preventing COVID-19. This study was conducted to determine the KAP of pregnant women in the Rural Health Unit-Tayug, Pangasinan using a questionnaire. Pregnant women who obtained a positive pregnancy test up to the 40th week of pregnancy were selected for the research. Frequency, percentage, AWM, T-test, and ANOVA test were the statistics used in the study. The majority of the respondents belonged to the 21-30 years old age bracket, were single, high school graduate, unemployed, Roman Catholic, had one child, and had a monthly family income of less than 15, 000 pesos. Pregnant women were knowledgeable on COVID-19 causes, signs and symptoms, mode of transmission, and management protocol. There was no significant difference between the KAP of the pregnant women across their profile variables except that those employed yielded significantly in attitude. KAP of pregnant women has no significant relationship with the profile variables. The pregnant women in this research had adequate knowledge and a positive attitude toward preventing COVID-19. Also, they highly practice preventive measures. Counseling and distribution of brochures are recommended to ensure the improvement of KAP of pregnant women in preventing COVID-19.

Keywords – knowledge, attitudes, practices, pregnant women, COVID-19

INTRODUCTION

　　First recognized in Wuhan City Hubei Province, China, Coronavirus disease 2019 (COVID-19) is caused by a novel coronavirus called severe acute respiratory syndrome coronavirus 2 (SARS-COV-2). The World Health Organization (WHO) first informed it on December 31, 2019. Furthermore, on January 30, 2020, the WHO announced that COVID-19 was a global health emergency. Then, on March 11, 2020, the WHO affirmed COVID-19 a global pandemic, its first designation since confirming H1N1 influenza was a pandemic in 2009 (Cennimo, 2021).

There were over 163 million people infected with COVID-19 around the globe as of May 15, 2021, with over 3 million deaths reported globally (covid19.who.int). Moreover, there are currently 56,709 active cases with 1,138,187 people affected by COVID- 19 in the Philippines, wherein 19,051 died as of May 15, 2021, according to the Department of Health.

As of May 15, 2021, the Philippines is in Stage 2 localized community transmission, with some areas presenting signs of higher community transmission. Also, there is an increasing trend in the number of cases and increasing spread in Region 3, Region 4A, and the National Capital Region, which is at Stage 3, large-scale community transmission (WHO, 2021).

The biological and immunologic alterations in pregnancy make women more susceptible to grave illnesses brought about by respiratory infections. Additionally, studies suggest that pregnant women with COVID-19 had increased rates of admission to intensive care units compared to women with COVID-19 who are not pregnant.

LITERATURE REVIEW

Effects of COVID-19 on Pregnant Women

Based on a study by Goyal et al. (2020), there was a decrease in institutional deliveries, an increase in high-risk pregnancies, and a rise in admission to the ICU of pregnant women during the COVID-19 pandemic. One-third of women had insufficient prenatal visits. The main reason for late pre-natal check-ups was the lockdown and their fear of getting the infection, causing almost half of the pregnant population acquiring complications.

Centers for Disease Control and Prevention recommends that people who are pregnant, those who are planning to get pregnant, and breastfeeding mothers should obtain their COVID-19 vaccinations. As of September 27, 2021, there were more than 125,000 confirmed COVID-19 reported cases in pregnant people, hospitalized with more than 22,000 cases who have been hospitalized and 161 mortalities. In August 2021, they recorded the highest number of COVID-19-related deaths in pregnant people in a month of the pandemic.

Pregnant women had a higher risk for severe disease from COVID-19 when compared with non-pregnant women. Severe illnesses mean that the patients need hospitalization, ICU care, or the use of a ventilator. It means illnesses that result in mortality. Pregnant women with COVID-19 are at a higher risk of premature birth, have a higher neonatal ICU admission rate for babies with COVID-19 positive mothers, and might be at increased risk of other pregnancy complications (CDC, 2021).

Importance of KAP in Preventing COVID-19

It is a recognized fact that to address a public health issue such as the COVID-19 global pandemic, the public's knowledge, and awareness are essential as obedience to the preventive actions depends on the level of knowledge, and understanding about the disease, and serious consequences are prohibited by if the precautionary measures are taken properly (Kumar and Pinky, 2020).

Based on a study on the knowledge and practice against COVID-19 infection among pregnant women in Africa by Nwafor et al. (2020), most pregnant females had sufficient knowledge of preventive measures against COVID-19 infection. However, the practice of these measures was poor among pregnant women. Also, participants who had more children, residents in the rural area, low level of education, and jobs like working on the farm, craftsperson, and trading were the factors related to the poor practice.

Also, the study by Nwafor found out that having at least primary education is often associated with easier access to health information. There is a high prevalence of adequate knowledge of intense information-sharing through media and other platforms. For example, since the emergence of the disease, there has been constant sharing of information on COVID-19 by the Philippine Government, civil society organizations, and individuals via social media, television, radio, and mobile van announcements.

The study of Lee et al. (2020) suggests that the social demographical factors such as the age of more than 36 years old, Malay ethnicity, employment in front line jobs, and attending high-risk clinics are significantly associated with the attitude and practices among pregnant women to COVID-19 in Singapore.

Degu et al. (2021) conducted a study on the knowledge and attitude toward the COVID-19 and the associated factors affecting antenatal care in Ethiopia. The findings of the study showed that almost half of the participants had adequate knowledge and a positive attitude towards COVID-19. The participants' age, educational attainment, occupation, and condition of current pregnancy were related to their level of awareness of COVID-19.

Moreover, the findings of the study by Hoque et al. (2021) showed that the majority of the pregnant women had good practices in preventing COVID-19. However, they had insufficient knowledge and attitude towards the disease. Additionally, low educational attainment and other factors were significantly related to these.

Moreover, there was a limited number of studies regarding this subject matter since the pandemic was recently acknowledged. The fight against COVID-19 is still ongoing worldwide. People's compliance with these preventive measures is significant to ensure that we win the battle against this infection, primarily affected by their knowledge, attitudes, and practices (KAP) towards COVID-19. Therefore, this study determined the knowledge, attitudes, and practices of pregnant women in preventing COVID- 19.

METHODOLOGY

The researchers used a descriptive, normative survey. By employing a self-reported questionnaire used to explore and describe knowledge, attitudes, and practices regarding COVID-19 infection. The questionnaire was validated by experts in research. Furthermore, it determined the mean, frequency, percentage, and other statistical calculations, thus identifying the study as quantitative research.

The researchers conducted the study in Tayug, Pangasinan. Questionnaires were floated during the barangay visit of the midwives to the pregnant women. Participants selected were women who obtained positive pregnancy tests up to the 40th week of pregnancy. The researchers used convenience sampling. The researchers included fifty pregnant women from different barangays in the study. Pregnant women were not yet vaccinated with the COVID-19 vaccine.

The researchers adopted the survey according to World Health Organization (WHO) and Department of Health (DOH) guidelines on preventing COVID-19 infection. Additionally, this questionnaire assessed pregnant women's knowledge about COVID- 19 in terms of the causes, signs and symptoms, mode of transmission, and management protocol. Also, the survey determined the attitudes and practices of the respondent in the prevention of COVID 19. Part one dealt with the demographic profile of the respondents, which includes their age, marital status, occupation, highest educational attainment, religion, number of children, and monthly family income. Part two focused on the knowledge, attitudes, and practices of pregnant women in preventing COVID-19.

After the approval of the request by the Municipal Health Officer, the researchers personally distributed the questionnaires to the target respondents observed health

protocols, and assisted them in answering during their follow-up check-ups in the Rural Health Unit or Barangay Health Centers. The researchers then collected the accomplished questionnaires followed by the statistical evaluation of the raw data.

The study utilized different statistical tools. Moreover, in problem no.1, the researcher used frequency and percentage in the profile of the respondents, with the following formula (Equation 1):

$$P = \frac{f}{n} \times 100$$

Equation 1

where,

P = Percentage

f = frequency of responses

n = total number of respondents

Additionally, in problem no. 2, weighted mean was used in the Knowledge, attitudes and practices of the respondents in the prevention of COVID 19 (Equation 2):

$$AWM = \frac{\sum f_i x_i}{n}$$

Equation 2

where,

$\sum$ = summation

$\sum f_i x_i$ = the total frequencies

n = the number of respondents

The questions were answered using the 5-point Likert scale (Table 1, Table 2, and Table 3):

Table 1. The Likert scale used in the Knowledge part of the questionnaire

Statistical Limit	Numerical Value	Descriptive Equivalent	Transmuted Rating
4.50-5.00	5	Always	Highly Knowledgeable
3.50-4.49	4	Often	Knowledgeable
2.50-3.49	3	Sometimes	Moderately Knowledgeable
1.50-2.49	2	Seldom	Slightly Knowledgeable
1.00-1.49	1	Never	Not Knowledgeable

Table 2. The Likert scale used in the Attitude part of the questionnaire

Statistical Limit	Numerical Value	Descriptive Equivalent	Transmuted Rating
4.50-5.00	5	Always	Highly Agree
3.50-4.49	4	Often	Agree
2.50-3.49	3	Sometimes	Moderately Agree
1.50-2.49	2	Seldom	Slightly Agree
1.00-1.49	1	Never	Not Agree

Table 3. The Likert scale used in the Practice part of the questionnaire

Statistical Limit	Numerical Value	Descriptive Equivalent	Transmuted Rating
4.50-5.00	5	Always	Highly Practiced
3.50-4.49	4	Often	Practiced
2.50-3.49	3	Sometimes	Moderately Practiced
1.50-2.49	2	Seldom	Slightly Practiced
1.00-1.49	1	Never	Not Practiced

Problem numbers 3 and 4 on the significant difference and relationship, the researcher used t-test (Equation 3) and ANOVA (Equation 4) with the following formula:

t-test:

$$t = \frac{\overline{X} - \mu}{s / \sqrt{n}}$$

Equation 3

where,

t = the t statistic

$\overline{X}$ = the mean of the sample

μ = the comparison mean

s = the sample standard deviation

n = the sample size

ANOVA:

$$F = \frac{MSE}{MST}$$

Equation 4

where,

F is equal to ANOVA coefficient

MST is the Mean sum of squares due to treatment

MSE is the Mean sum of squares due to error

The level of significance is set at 0.05

RESULTS AND DISCUSSION

Age. The majority of the respondents belonged to the 21-30 years old bracket with a frequency of 24 or 48%, followed by the 31-40 years old bracket with a frequency of 17 or 34 %. Moreover, it showed that the respondents were young and in their young adulthood.

Marital status. The majority of the respondents were single with a frequency of 29 or 58%, while those married comprised 21 or 42%. Additionally, it showed that the respondents had their families without being married. However, 21 of them were married.

Educational attainment. The majority of the respondents were high school graduates with a frequency of 30 or 60%, college-level with 8 or 16%, and college graduates with a frequency of 7 or 14%. Also, most respondents did not pursue their college education.

Table 4. Distribution of the Pregnant women in terms of their Profile Variables (n=50)

Profile Variables	frequency	percentage
Age (in years)		
20 and below	9	18.0
21 – 30	24	48.0
31 – 40	17	34.0
Marital Status		
Single	29	58.0
Married	21	42.0
Educational Attainment		
Elementary Graduate	2	4.0
High School Graduate	30	60.0
College Level	8	16.0
Vocational	3	6.0
College Graduate	7	14.0
Occupation		
Unemployed	40	80.0
Employed	10	20.0
Religion		
Roman Catholic	39	78.0
Iglesia ni Cristo	3	6.0
Born Again	7	14.0
Islam	1	2.0
Number of Children		
One	19	38.0
Two	17	34.0
Three or more	14	28.0
Monthly Income (in Php)		
Less than 15,000	44	88.0
16,000 – 35,000	6	12.0

Occupation. The majority of the respondents were unemployed, 40 or 80% and some of them were employed 10 or 20%. Moreover, it implied that the respondents have their work as a source of their income.

Religion. Roman Catholic was the highest among the mentioned religion with 39 or 78%, followed by Born Again with a frequency of 7, Iglesia ni Cristo (7) or 14%, and Islam (1) or 2%. Also, it revealed that Roman Catholicism is the most dominant religion.

Number of children. The majority of respondents had one child, 19 or 38%, followed by two children, and three or more with a frequency of 17 and 14 or 34 and 28%, respectively. Also, it implied that most of them had only one child.

Table 5. The Extent of Knowledge of the Pregnant Women on COVID-19 along with Causes (n=50)

Indicators	Weighted Mean	Descriptive Equivalent
SARS-COV2 (severe- acute respiratory syndrome Coronavirus 2) is a virus that causes COVID-19	4.40	K
COVID-19 began in bats and passed to other mammals	3.22	MK
I know the dissimilarity between viruses and bacteria	4.06	K
I have enough Knowledge of viral infections.	3.86	K
I know that the COVID-19 started in Wuhan City, Hubei Province, China	4.56	HK
Older people and people with co-morbidities (such as asthma, diabetes, and heart diseases) can be severely affected by the COVID-19	4.38	K
COVID-19 can infect all people, regardless of Age	4.36	K
Pregnant women like *me* are considered vulnerable to contracting COVID-19 infection	3.94	K
COVID-19 can be confirmed after positive RT-PCR results (Swab test)	4.58	HK
I know what a COVID-19 vaccine is	4.02	K
Average Weighted Mean	**4.14**	**K**

Monthly family income. The majority of the respondents earned less than P15,000 a month with a frequency of 44 or 88%. On the contrary, other respondents earned P16,000 and above with a frequency of 6 or 12%. Furthermore, it revealed that the majority earned an average income enough for their family.

Table 5 indicated that the highest among the indicators are numbers 5 and 9 "*I* know that the COVID-19 virus started in Wuhan City, Hubei Province, China", and "COVID-19 can be confirmed after positive RT-PCR results (Swab test)" with a weighted mean of 4.56 and 4.58 or "Highly Knowledgeable". The lowest among the indicators is item number 2, "COVID-19 began from bats and passed to other mammals," with a weighted mean of 3.22 or "Moderately Knowledgeable."

Overall, the extent of knowledge of the pregnant women on COVID-19 along with causes got an average weighted mean of 4.14 or equaled to "Knowledgeable." Furthermore, it implied that the respondents have ideas on the causes of COVID-19. A study by West et al. (2021) corroborated the findings, which found that one hundred and sixty-six respondents knew the cause of COVID-19 was viral in origin.

Table 6. The Extent of Knowledge of the Pregnant Women on COVID-19 along with Signs and Symptoms (n=50)

Indicators	Weighted Mean	Descriptive Equivalent
Some patients with positive RT-PCR results (swab test) are asymptomatic.	4.02	K
Fatigue, fever or high temperature, and cough are the most common manifestations of COVID-19.	4.56	HK
One symptom of COVID-19 is the difficulty of breathing.	4.54	HK
Symptoms include loss of taste and smell.	4.40	K
Symptoms include diarrhea.	3.58	K
Symptoms include headache.	4.14	K
Symptoms include a sore throat.	4.30	K
Symptoms include nasal congestion.	4.08	K
Pneumonia is the most common complication of COVID-19.	4.28	K
Death can be a result of severe COVID-19.	4.58	HK
Average Weighted Mean	**4.25**	**K**

Table 6 presented that the highest indicators are item numbers 2, "Fatigue, fever or high temperature and cough are the most common manifestations of COVID-19", 3 "One symptom of COVID-19 is the difficulty of breathing," and 10 "Death can be a result of severe COVID-19." The weighted mean was 4.54, 4.56, and 4.58, respectively, or "Highly Knowledgeable."

The lowest indicators are items numbers 5 and 1 "Symptoms include diarrhea" and "Some patients with positive RT-PCR results (swab test) are asymptomatic" with a weighted mean of 3.58 and 4.02 or "Knowledgeable." Furthermore, it revealed that the respondents were unaware of having diarrhea for COVID-19 patients and those with positive RT-PCR are asymptomatic.

Overall, the extent of knowledge of the pregnant women on COVID-19 along with signs and symptoms got an average weighted mean of 4.25 or "Knowledgeable." Moreover, it implied that the respondents lacked some information on the other signs and symptoms of COVID-19. A study by Maharlouei et al. (2020) verified the results, which suggests that the majority of the participants had adequate knowledge regarding the most common symptoms of COVID-19.

Table 7. The Extent of Knowledge of the Pregnant Women on COVID-19 along with Mode of Transmission (n=50)

Indicators	Weighted Mean	Descriptive Equivalent
COVID-19 spreads via respiratory droplets when infected individuals cough or sneeze.	4.48	K
COVID-19 spreads through close contact with individuals who have it.	4.42	K
COVID-19 can be passed by sharing personal items.	4.16	K
COVID-19 incubation period could be 3-7 days up to 2 weeks.	3.76	K

Individuals who have been exposed to the virus may transfer the infection even before they show symptoms.	4.36	K
COVID-19 can be passed by handshaking and hugging other people.	4.28	K
Touching the face, eyes, nose, and mouth can transmit COVID-19.	4.40	K
Going in a social crowd can transmit COVID-19.	4.52	HK
Talking to any individuals with a distance of less than one meter from others can transfer COVID-19.	4.10	K
Communal eating can transmit COVID-19.	3.94	K
Average Weighted Mean	**4.24**	**K**

Table 7 indicated that the highest item is number 8, "Going on a social crowd can transmit COVID-19," with a weighted mean of 4.52 or "Highly Knowledgeable." Additionally, it implied that the respondents were aware that congested places can transmit the COVID-19 virus.

Table 8. The Extent of Knowledge of the Pregnant women on COVID-19 along with Management Protocol (n = 50)

Indicators	Weighted Mean	Descriptive Equivalent
Isolation is the best remedy to prevent the spread of COVID-19 infection.	4.50	HK
COVID-19 treatment does not include antibiotics.	3.88	K
Patients in the hospital may receive antibiotics since bacterial infections can occur.	4.08	K
There's no specific anti-viral treatment for COVID-19.	3.80	K
COVID-19 vaccines are now available	4.58	HK
The process of classifying, evaluating, and handling people exposed to COVID-19 to prevent its spread is called contact tracing.	4.30	K
People with COVID-19 have mild symptoms and can stay at home while recovering without medical attention.	3.78	K
Monitor your symptoms once you are symptomatic and follow the instructions from your healthcare worker and local health unit.	4.48	K
If you are sick, wear a mask over your nose and mouth.	4.62	K
Watch out for emergency signs of COVID-19, for example, shortness of breath, persistent pain in the chest and paleness, or cyanosis of the skin, lips, or nail beds.	4.62	HK
Average Weighted Mean	**4.26**	**K**

The lowest indicators are item numbers 4 and 10 "COVID-19 incubation period could be 3-7 days up to 2 weeks" and "Communal eating can transmit COVID-19." with a weighted mean of 3.94 and 3.76 or "Knowledgeable." Furthermore, it connotes that the respondents were unaware of the incubation period of COVID-19, and eating with other people without observing physical distancing can transfer the virus.

Overall, the extent of knowledge of the pregnant women on COVID-19 along with the mode of transmission got an average weighted mean of 4.24 or "Knowledgeable." Moreover, it only showed that there are other things that the respondents must know about the mode of transmission of the disease. Although, this is in contrast to a study conducted by Maharlouei et al. (2020), wherein the routes of transmission of the COVID-19 yield to highest Knowledge score.

It can be noted from table 8 that the highest indicators were item numbers 1, 5, and 10, "Isolation is the best approach to prevent the spread of COVID-19 infection," "COVID-19 vaccines are now available," and "Watch out for emergency signs of COVID-19 for example, shortness of breath, persistent pain in the chest, and paleness or cyanosis of the skin, lips and nail beds" with a weighted mean of "Highly Knowledgeable."

Also, it implied that the respondents were aware of vaccines and the danger signs of patients with COVID-19. The findings were similar to a study by Adegoke et al. (2020), which suggests that a majority 299(82%) of the respondents agreed that quarantining sick people can help contain the spread of the infection; 47 (13%) do not approve, whereas 20 (5%) are not aware.

The lowest indicators are item numbers 4 and 7, "There's no specific anti-viral treatment for COVID-19," and "People with COVID-19 have mild symptoms and can stay at home while recovering without medical attention," with a weighted mean of 3.78 and 3.80 or "Knowledgeable." The respondents were not Knowledgeable of the anti-viral treatment and recovery at home without medical treatment.

Overall, the knowledge of the pregnant women on COVID-19 along management protocol got an average weighted mean of 4.26 or "Knowledgeable." The results implied that the respondents were somewhat knowledgeable about management protocols.

Table 9. The Extent of Knowledge of the Pregnant Women on COVID-19.
n=50

Categories	Weighted Mean	Descriptive Equivalent
Causes	4.14	K
Signs and Symptoms	4.25	K
Mode of Transmission	4.24	K
Management Protocol	4.26	K
Overall Weighted Mean	**4.23**	**K**

As gleaned from Table 9 all the variables were rated "Knowledgeable," with varying weighted means very close to each other. The highest score was on management protocols, with a weighted mean of 4.26. Furthermore, they were followed by signs and symptoms and Mode of transmission, with a weighted mean of 4.25 and 4.24, respectively. The lowest score was on the causes of COVID-19.

Overall, the extent of knowledge of the pregnant women on COVID-19 got an overall weighted mean of 4.23 or "Knowledgeable." Additionally, it revealed that the respondents had information on COVID-19. It supports the findings of Goudah et al. which implied that pregnant women included in the study have a high level of awareness regarding COVID-19 symptoms and how to avoid viral transmission.

Table 10. The Attitudes of the Pregnant Women in the Prevention of COVID-19 (n=50)

Indicators	Weighted Mean	Descriptive Equivalent
I believe that we will finally control the pandemic.	4.56	HA

I have confidence that the Philippines will win its battle against COVID-19.	4.62	HA
I often check for COVID-19-related news and updates.	4.38	A
It's essential to come to *my* antenatal appointments even during the pandemic.	4.62	HA
I am concerned about taking preventive measures against COVID-19.	4.46	A
I follow the news about COVID-19 on social media.	4.46	A
I follow all health and safety protocols mandated by our government.	4.50	HA
I receive emotional support from *my* households and *my* social networks.	4.24	A
I consider *myself* at risk of COVID-19.	4.22	A
I believe vaccines will aid in the eradication of COVID-19 infection.	4.52	HA
Average Weighted Mean	**4.46**	**A**

As gleaned from table 10 that 5 of the indicators were rated "Highly Agree," and five were rated "Agree." The highest among the indicators are numbers 2 and 4 "*I* have confidence that the Philippines will win its battle against COVID-19" and "It's essential to come to *my* antenatal appointments even in the pandemic," with a weighted mean of 4.62 or "Highly Agree." Thus, it revealed that the respondents believed that our country would surpass the pandemic we encountered. Also, their pre-natal check-ups are necessary even during the pandemic to monitor the babies before the delivery.

The lowest indicators are numbers 8 and 9, "*I* receive emotional support from my households and my social networks" and "*I* consider myself at risk of COVID-19," with a weighted mean of 4.22 and 4.24, respectively, or "Agree."

Overall, the attitudes of the pregnant women in the prevention of COVID-19 got an average weighted mean of 4.46 or "Agree." It implied that the respondents agreed on the cited indicators in the prevention of COVID-19. The findings were the same as a study by Yassa et al. (2020), which suggests that pregnant women have a positive attitude and compliance toward the COVID-19 outbreak and front-line healthcare staff, increased concern and vulnerability, and limited Knowledge about the pregnancy-related outcomes.

Table 11. The Practices of the Pregnant Women in the Prevention of COVID-19 (n=50)

Indicators	Weighted Mean	Descriptive Equivalent
Wear masks and face shields when leaving home.	4.72	HP
Practice proper handwashing with soap and water.	4.68	HP
Maintain more than 1 meter (3 feet) away from others.	4.52	HP
People with fever, cough, and difficulty breathing should seek medical attention without delay.	4.68	HP
Use 70% Isopropyl or Ethyl Alcohol for hand rubbing.	4.66	HP
Avoid touching eyes, face, mouth, and nose.	4.66	HP
Stopped shaking hands while giving a greeting.	4.64	HP

Avoid going to crowded places (such as markets, public transportation, *etc.*).	4.56	HP
Surfaces that are infected should be avoided, such as (door handles, stair poles, and equipment).	4.56	HP
Use cover or elbow for coughing or sneezing.	4.54	HP
Avoid attending parties or social gatherings.	4.46	P
Staying at home.	4.54	HP
Average Weighted Mean	**4.60**	**HP**

Based on table 11, the respondents rated most of the indicators as "Highly Practiced," with a weighted mean ranging from 4.50 to 5.00. Therefore, the respondents practiced the said indicator in the prevention of COVID-19. Also, it shows that they were aware of the prevention of the disease, especially with their condition as pregnant.

Additionally, it is consistent with the study by Goudah et al. (2021), which suggests that most pregnant women said that they are using soap and water in performing regular hand washing and are maintaining a distance of more than 1 meter from each other or known as social distancing. The majority of them use alcohol when hand rubbing and use antiseptics on the equipment. However, the item "Avoid attending parties or social gatherings," with a weighted mean of 4.46, was rated as Practiced.

Overall, the practices of pregnant women in the prevention of COVID-19 got an average weighted mean of 4.60 or "Highly Practiced." Therefore, it revealed that the respondents knew the preventive practices of COVID-19. Additionally, it is similar to the study of Hoque et al. (2021), which showed that the preventive measures for pregnant women on COVID-19 were commendable.

Table 12. ANOVA Results on the Difference in the Knowledge, Attitudes, and Practices of the Pregnant Women on COVID-19 across Age

	Source of Variation	Sum of Squares	Df	Mean Squares	F-value	Sig	Remarks
Knowledge	Between Groups	0.065	2	0.032			
	Within Groups	17.477	47	0.372	0.087	0.917	Not Significant
	Total	17.542	49				
Attitude	Between Groups	0.145	2	0.072			
	Within Groups	23.357	47	0.497	0.145	0.865	Not Significant
	Total	23.502	49				
Practices	Between Groups	0.003	2	0.002			
	Within Groups	21.286	47	0.453	0.003	0.997	Not Significant
	Total	21.290	49				

As seen in Table 12, the analysis revealed insignificant results, which suggest the acceptance of the null hypothesis. Also, it states that there exists no significant difference in the knowledge, attitude, and practices of the respondents on COVID-19. The result means that the pregnant women share the same level of expertise on COVID-19, including their philosophy and practices, when grouped according to age. Additionally, it supports the findings of Kumbeni et al. which suggest that age is not associated with pregnant women's knowledge and preventive practice on COVID-19.

Table 13. t-Test Results on the Difference in the Knowledge, Attitude, and Practices of the Pregnant Women on COVID-19 across Marital Status.

Aspect	Marital Status	n	Mean	Mean Difference	Standard Error Difference	df	t-value	Sig	Remarks
Knowledge	Single	29	4.17	-0.125	0.172	48	-0.723	0.473	Not Significant
	Married	21	4.30						
Attitude	Single	29	4.49	0.084	0.200	48	0.418	0.678	Not Significant
	Married	21	4.41						
Practices	Single	29	4.64	0.096	0.190	48	0.505	0.616	Not Significant
	Married	21	4.55						

Table 13 shows the t-test results of the difference in Knowledge, attitude, and practices of the Pregnant women on COVID-19 in terms of marital status. Additionally, it agrees with the findings of Kumbeni et al. (2021), which implies that marital status is not significantly related to Pregnant women's Knowledge and preventive practices on COVID-19.

Table 14. ANOVA Results on the Difference in the Knowledge, Attitude, and Practices of the Pregnant Women on COVID-19 across Highest Educational Attainment.

	Source of Variation	Sum of Squares	df	Mean Squares	F-value	Sig	Remarks
Knowledge	Between Groups	0.968	4	0.242	0.657	0.625	Not Significant
	Within Groups	16.574	45	0.368			
	Total	17.542	49				
Attitude	Between Groups	2.558	4	0.640	1.374	0.258	Not Significant
	Within Groups	20.944	45	0.465			
	Total	23.502	49				
Practices	Between Groups	2.471	4	0.618	1.477	0.225	Not Significant
	Within Groups	18.818	45	0.418			
	Total	21.290	49				

As shown in table 14, there is no significant difference in the knowledge, attitude, and practices when grouped according to the highest educational attainment of the respondents. The computed F-values had generated significance values that were higher than the set .05 level of significance.

The results imply that level of education does not affect the knowledge, attitude, and practices of pregnant women on COVID-19. It is consistent with the findings of Nwafor et al. (2020). Consequently, having at least primary education is often associated with easier access to health information. Intense information sharing through media and other platforms causes a high prevalence of adequate Knowledge.

Table 15. t-Test results on the difference in the Knowledge, Attitude, and Practices of the Pregnant Women on COVID-19 across Occupations.

Aspect	Occupation	N	Mean	Mean Difference	Standard Error Difference	t-value (df = 48)	Sig	Remarks
Knowledge	Unemployed	40	4.15	-0.400	0.206	-1.941	0.096	Not Significant
	Employed	10	4.55					
Attitude	Unemployed	40	4.39	-0.353	0.242	-1.456	0.034	Significant
	Employed	10	4.74					
Practices	Unemployed	40	4.55	-0.245	0.233	-1.050	0.087	Not Significant
	Employed	10	4.80					

In Table 15, a significant difference exists in attitude can be noted. Furthermore, the negative mean Difference indicates that the employed respondents have a more positive attitude than the unemployed. The findings of Lee et al. (2020), suggest employment in front-line jobs and attendance at high-risk clinics are likely to influence the attitude and precaution measures among pregnant women toward COVID-19 in Singapore can prove the results.

Meanwhile, t-values along with knowledge and practices reveal insignificant results, which means that the level of knowledge on COVID-19 of the employed and unemployed respondents is comparable. Rules on COVID-19 for pregnant women are the same when grouped according to occupation. The employment status is not significantly associated with the preventive methods of pregnant women in South Nigeria, as verified by the study of Hoque et al. (2020).

As shown in Table 16, the computed F-values generated significant values higher than the set .05 level of significance that directs to the acceptance of the null hypothesis which states that there exists no significant difference in the knowledge, attitude, and practices of the participants on COVID-19 in terms of religion. It means that the religious belief of the respondents does not cause variation in their knowledge, attitude, and practices on COVID-19.

Table 17 shows computed F-values and significance values indicate insignificant results that mean that the number of children that the respondents have does not affect their knowledge, attitude, and practices on COVID-19. Similar to the study by Kumbeni et al. (2021), which suggests that parity was not significantly associated with pregnant women's Knowledge and preventive practices on COVID-19.

Table 16. ANOVA Results on the Difference in the Knowledge, Attitude, and Practices of Pregnant Women on COVID-19 across Religions.

	Source of Variation	Sum of Squares	df	Mean Squares	F-value	Sig	Remarks
Knowledge	Between Groups	0.169	3	0.056	0.149	0.930	Not Significant
	Within Groups	17.373	46	0.378			
	Total	17.542	49				
Attitude	Between Groups	0.848	3	0.283	0.574	0.635	Not Significant
	Within Groups	22.654	46	0.492			
	Total	23.502	49				
Practices	Between Groups	0.693	3	0.231	0.516	0.673	Not Significant
	Within Groups	20.596	46	0.448			
	Total	21.290	49				

Table 17. ANOVA Results on the Difference in the Knowledge, Attitude, and Practices of the Pregnant Women on COVID-19 across Number of Children

	Source of Variation	Sum of Squares	df	Mean Squares	F-value	Sig	Remarks
Knowledge	Between Groups	0.261	2	0.131	0.355	0.703	Not Significant
	Within Groups	17.281	47	0.368			
	Total	17.542	49				
Attitude	Between Groups	0.970	2	0.485	1.012	0.371	Not Significant
	Within Groups	22.532	47	0.479			
	Total	23.502	49				
Practices	Between Groups	0.396	2	0.198	0.445	0.643	Not Significant
	Within Groups	20.894	47	0.445			
	Total	21.290	49				

Table 18. t-test Results on the Difference in the Knowledge, Attitude, and Practices of the Pregnant Women on COVID-19 across Monthly Family Income

Aspect	Monthly Family Income	N	Mean	Mean Difference	Standard Error Difference	t-value (df = 48)	Sig	Remarks
Knowledge	Less than Php15,000	44	4.29	0.504	0.253	1.994	0.052	Not Significant
	Php16,000-Php35,000	6	3.78					
Attitude	Less than Php15,000	44	4.49	0.274	0.302	0.908	0.368	Not Significant
	Php16,000-Php35,000	6	4.22					
Practices	Less than Php15,000	44	4.64	0.307	0.286	1.071	0.289	Not Significant
	Php16,000-Php35,000	6	4.33					

As shown in Table 18, the computed t-values revealed significant values higher than the given 0.05 level of significance, suggesting that the null hypothesis had to be accepted. Consequently, the respondents with a monthly income lower than 15,000 pesos have the same level of Knowledge, attitude, and practices on COVID-19 as the group of respondents whose monthly income is within the bracket 16,000-35,000 pesos. However, the study conducted by Maharlouei et al. (2020), suggested that the mean score of Knowledge was significantly the highest in cases whose income was more than their expenditure.

Table 19. Relationship Between the Knowledge, Attitude, and Practices of the Pregnant Women on COVID-19 and their Profile variables.

	Knowledge		Attitude		Practices	
Profile Variable	r-value	sig	r-value	sig	r-value	sig
Age	-0.025	0.862	-0.077	0.593	0.001	0.997
Marital Status	0.104	0.473	-0.060	0.678	-0.073	0.616
Highest Educational Attainment	0.182	0.207	0.192	0.183	0.229	0.109
Occupation	0.270	0.058	0.206	0.`152	0.150	0.299
Religion	-0.027	0.850	0.129	0.372	0.154	0.287
Number of Children	-0.009	0.949	-0.138	0.340	-0.129	0.372
Monthly Family Income	-0.277	0.052	-0.130	0.368	-0.153	0.289

Table 19 showed all computed r-values have significant values higher than the set 0.05 level of significance. Therefore, it only shows no significant relationship between the level of knowledge on COVID-19 of the respondents and their profile variables. Similarly, there exists no significant relationship between the attitude and practices of the respondents and their profile variables.

CONCLUSIONS AND RECOMMENDATIONS

Pregnant women in Tayug, Pangasinan were knowledgeable about COVID-19 regardless of their age, civil status, highest educational attainment, occupation, religion, the number of children, and monthly family income. This study suggests that the pregnant women in Tayug, Pangasinan were knowledgeable in terms of causes, signs and symptoms, mode of transmission, and management protocol of COVID-19. It is also included that they have a good attitude and preventive practices in the prevention of COVID-19. Further reinforcement in this area is needed to ensure that pregnant women have enough knowledge regarding COVID-19.

Pregnant women who are employed have a better attitude than the unemployed ones in this study. However, pregnant women are knowledgeable, has a good attitude, and are compliant with preventive practices regardless of their profile variables. There is no correlation between the knowledge, attitudes, and practices of pregnant women on COVID-19 across their profile variables. It is therefore included that the respondents share the same knowledge, attitudes, and practices concerning COVID-19.

Continuous health education regarding knowledge, attitude, and practices in COVID-19 prevention are essential, especially nowadays that the number of people affected by the virus is continuously increasing. Furthermore, with the limited number of vaccines arriving in our country and with the fact that COVID-19 still has no definitive treatment yet, it is significant for people to adhere to the health and safety protocols. Also, as health care workers, it is our responsibility to educate the community through health teachings by using information education material or brochures formulated by the researcher.

Conduct other studies or subjects regarding knowledge, attitudes, and practices on COVID-19 like the indigents or the marginalized to compare results with the previous studies. Questionnaires for future researchers should include the extent of knowledge along with causes, mode of transmission, signs, symptoms, and management protocol.

Also, a more comprehensive study on the KAP of Pregnant women in preventing COVID-19 should be conducted. Furthermore, future studies should include other variables like the level of anxiety and the perception of pregnant women. Also, strengthening public health education campaigns to the general public and at-risk groups such as pregnant women should be included.

Researchers should include in their research topics the following: (a) the effectiveness of COVID-19 vaccines on Pregnant women and lactating mothers, (b) include more participants for future research to broaden the comparison to age, marital status, highest educational attainment, occupation, religion, number of children, and monthly family income concerning their knowledge, attitudes, and practices in preventing COVID-19.

Furthermore, qualitative research should be considered to understand why some pregnant women practice some measures. Additionally, an in-depth study of the KAP of pregnant women in preventing COVID-19. Also, the elderly and persons with co-morbidity should be included in future studies.

IMPLICATIONS

Based on the study's findings, particular attention should be given to pregnant women who were adolescents and teenagers. Since only some of the pregnant women were fully vaccinated and teenage pregnancy requires specialized care, health teachings about COVID-19 and emphasis on the importance of pre-natal check-ups are essential because they are more prone to have COVID-19. Furthermore, pregnant women who are elementary graduates should be considered since only 2 of the respondents were included in the study. The majority of the respondents were Roman Catholic, others with diverse religions should be included in future research. Additionally, individuals whose income is higher than their expenditures should be included in future research and comparison.

Flyers devised by the researcher should be disseminated as information on knowledge, attitudes, and practices in preventing COVID-19 in the community or the hospital. Additionally, reproductions such as tarpaulins should be allowed and posted in the hospital vicinity wherein pregnant women usually go to the OB-Gynecologic clinic or in the labor and delivery room. Also, it serves as a guide for community health workers during their visits to pregnant women to do their counseling and during their health teaching with the community people. Also, with the rise of technology, brochures can be posted online so that people can have guidelines to follow, and information dissemination can be easy. Moreover, COVID-19 can soon be controlled and managed by the use of vaccines and health education in the community and hospital.

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