

# Perceptions on Susceptibility to Exposure to the COVID-19 Virus: A Qualitative Study on Pregnant and Non-pregnant Adult Women, their Partners, and Healthcare Workers in Metro Manila

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## ABSTRACT

**Introduction.** The World Health Organization (WHO) reported that special populations are more susceptible to the COVID-19 virus. There is little information on whether COVID-19 affects women of reproductive age and their fertility, pregnancy status, and offspring give: We aimed to assess the knowledge, practices, and perceptions (KPP) on the risk and susceptibility to COVID-19 of women of reproductive age.

**Methods.** We conducted a qualitative exploratory descriptive study using the triangulation method. The study consisted of in-depth interviews (IDIs) with women of reproductive age and their spouses, focus group discussions (FGDs), and key informant interviews (KIIs) with health care professionals (HCP) in University of the Philippines-Philippine General Hospital. We assessed KPP using structured, open-ended interview guides. Interview responses were recorded and transcribed verbatim, and thematic analysis was performed using NVivo 12.

**Results.** Eighty participants, 20 women of reproductive age, 20 spouses, 20 non-pregnant women, and 20 HCPs in UP-PGH were included in the study. All participants were knowledgeable about COVID-19. Pregnant women would consult their physicians when they felt symptoms related to COVID-19. Spouses of pregnant women and non-pregnant women observed health measures to prevent the spread of the virus. Both pregnant and non-pregnant patients with COVID-19 felt shamed and stigmatized while the husbands worried that the exposure to the infection will pose a burden to their families. HCWs provided services through teleconsultation and found it challenging to refer patients to other facilities.

**Conclusion.** The study provided insights on KPP of women with reproductive-age to COVID-19 and views of HCWs in providing care to these patients during the pandemic. The effects of COVID-19 are still detrimental and highly evident from the micro to the macro level.

*Keywords: qualitative research, knowledge, practices, perception, women of reproductive age, COVID-19*

## INTRODUCTION

COVID-19 persists as a global health issue since it started in December 2019 in Wuhan, China.<sup>1</sup> The coronavirus is a family of viruses that causes a number of mild illnesses such as colds and fever to severe diseases; and in the worst-case death. These illnesses are possibly caused by the Middle East Respiratory Syndrome-related Coronavirus (MERS-CoV) and Severe Acute Respiratory Syndrome-related Coronavirus (SARS-CoV).<sup>2</sup> In the Philippines, there are 11,370 active cases, 3,641,136 recovered cases, and 60,625 deaths<sup>3</sup> as of the first week of July 2022. Globally, the total number of positive

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cases has reached 552 million with lives lost to COVID-19 at 6.34 million.<sup>4</sup> Global statistics consistently show that most cases of COVID-19 present with mild symptoms (99.4%), and recover without the need for hospitalization.<sup>5,6</sup>

The World Health Organization (WHO) reported that people with comorbidities, such as those who are immunocompromised and those who have malignancy are likely to acquire COVID-19 with severe symptoms.<sup>7</sup> In contrast to the current sex-aggregated data for COVID-19, males are more prone to get infected by the virus and have a higher risk of presenting with severe symptoms. In a study by Pradhan and Olsson (2020),<sup>8</sup> viral RNA clearance was slower in males due to genetic predisposition and their sex organs harbored the virus longer. However, in another study by Dehingia and Raj (2021),<sup>9</sup> they argued that although globally, COVID-19 related mortality is more male-biased, in India, there are more women aged 40–49 years who die from COVID-19 than men. They have associated this with poorer access to health care for women.

Currently, there is no study that focuses on the knowledge, practices, and perceptions on risk and susceptibility (KPP) among women of reproductive age. There is a paucity of information on whether COVID-19 has an effect specifically on women of reproductive age — their fertility, pregnancy status, and babies. With the heightened fear and anxiety of the general population due to the virus, understanding their KPP is important to assess their health-seeking behaviors and minimize the spread of disease and possible maternal and fetal complications. The general objective of this study is to explore and describe the knowledge, practices, and perceptions on risk and susceptibility of women of reproductive age to COVID-19 exposure. The results of this study will help guide different stakeholders in developing concrete actions in referral and management of women of reproductive age with COVID-19.

## METHODS

### Study Design

This research is a qualitative exploratory descriptive study that employed a triangulation method composed of in-depth interviews (IDIs) of women of reproductive age and their partners, focus group discussions (FGDs), and key informant interviews (KIIs) of obstetric health professionals. Sociodemographic data was collected from patient records conforming to the Data Privacy Act of 2012 or RA 10173. Data gathered from the interviews and discussions were synthesized to contextualize the health-seeking behaviors of women of reproductive age in relation to COVID-19 exposure.

### Conceptual Framework

This study utilized different health frameworks used for health qualitative studies to guide the conduct of the interviews and discussion (Figure 1).

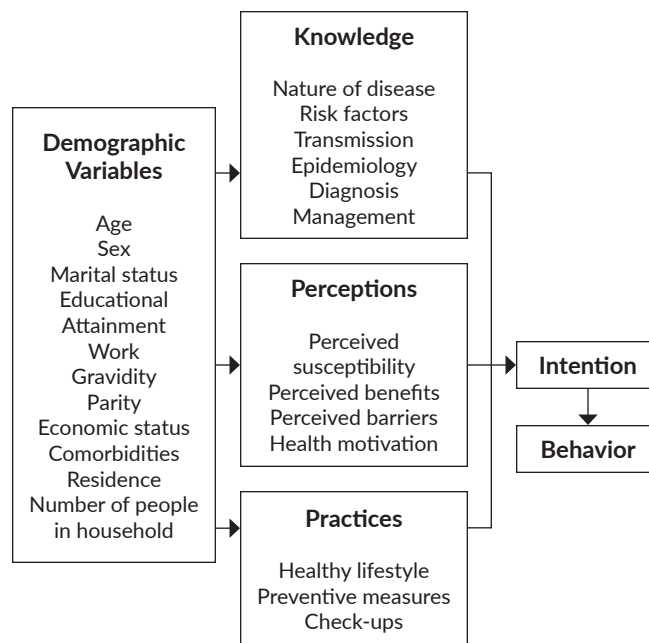


Figure 1. Conceptual framework of the study.

The first framework, the Health Belief Model, discusses a person’s decision to engage in preventive behavior to decrease their susceptibility to a disease or problem. Additionally, it explains that a person will likely practice preventive behavior when the risks of illness are severe, and the cost of wellness is greater than the risks.<sup>10</sup> In the study, the perceived susceptibility and risks of women of reproductive age in exposure to COVID-19 in relation to their socio-demographic profile were explored.

The second framework is the Theory of Planned Behavior, which states that a person’s intention drives their behavior. If an individual decides that the behavior is beneficial and the others approve of that behavior, then the individual is more likely to do and carry out the behavior.<sup>11</sup> By exploring the behaviors of women of reproductive age, and reinforcing approved guidelines to decrease the risk of contracting the disease and having maternal and fetal complications, a behavior change may be expected.

The third framework is the Gender Analysis Framework, which talks about how gender differences affect the lives and health of men and women.<sup>12</sup> The study only utilized the domains pertaining to practices and participation, and beliefs and perceptions. Current changes led by WHO from women’s rights to genders rights have been prominent as it does not focus on only one group. Assessing both sexes gave a holistic representation of the data to further understand and contextualize their risks from COVID-19.

### Setting and Population

Women of reproductive age were recruited from the University of the Philippines-Philippine General Hospital (UP-PGH), a designated COVID-19 referral hospital for

the National Capital Region (NCR). The majority of the cases in the country were concentrated in this region with 454,317 confirmed cases as of April 2021.<sup>13</sup>

We collected data from August 2020 to April 2021. This time frame was during the first surge of COVID-19 in the Philippines. National lockdown measures were strictly implemented to decrease the transmission of disease. No vaccines were readily available for pregnant women and people without comorbidities.

Forty women of reproductive age (18–50 years) - 20 pregnant (10 COVID-19 positives, 10 COVID-19 negatives) and 20 non-pregnant (10 COVID-19 positives, 10 COVID-19 negatives) - who underwent COVID-19 testing were recruited via purposive sampling. The partners of pregnant women were also invited. Twenty obstetric health professionals consisting of obstetrician-gynecologists (OB-GYN), general practitioners (GP), nurses, and midwives were also recruited via purposive sampling. Informed consent was obtained from all participants. Those who did not provide consent were excluded and those who did not follow the study guidelines were withdrawn from the study.

**Data Collection Procedures**

To gain insights on the knowledge, perceptions, and practices of women of reproductive age, 20 healthcare workers (HCWs), 20 non-pregnant women of reproductive age, 20 pregnant women, and 20 spouses of the pregnant women included were selected purposely and were interviewed on their health-seeking behaviors related to COVID-19 exposure.

**In-depth Interviews of Women of Reproductive Age and their Partners**

We conducted IDIs of women of reproductive age and the partners of pregnant women. The interviewers were native Filipino speakers with a background on obstetric healthcare and general knowledge of COVID-19. The IDIs consisted of two parts: (1) participants’ sociodemographic profile (age, marital status, gravidity, parity, educational status, profession, and residence), and; (2) health-seeking behaviors highlighting their KPP in relation to COVID-19 and its management. Outcomes of pregnancy and presence of complications were also gathered on follow-up.

The three main questions were:

1. “What is your general concern regarding exposure to COVID-19?” (to cover severity);
2. “Do you think there is a risk for exposure to COVID-19 for yourself/your baby?” (for susceptibility)
3. “What were your experiences during the enhanced community quarantine period?” (for the experience)

Additionally, a topic guide containing open-ended questions was also used to explore the participants’ experiences (Table 1).

**Table 1.** IDI topic guide

Domain	Question
<b>Knowledge</b>	<ol style="list-style-type: none"> <li>1. Where did you first hear about COVID-19?</li> <li>2. What do you know about COVID-19?</li> <li>3. Who may get infected by this condition?</li> <li>4. Is COVID-19 contagious? How severe is it?</li> <li>5. What are the signs and symptoms of COVID-19? How do you manage them?</li> <li>6. What do you think are the reasons for getting COVID-19?</li> <li>7. How would you avoid getting infected by COVID-19?</li> </ol>
<b>Practices</b>	<ol style="list-style-type: none"> <li>1. How often do you go to a clinic or hospital for your check up/consultation?</li> <li>2. What would do if you think you are infected with COVID-19?</li> <li>3. To whom will you go or consult if you have COVID-19?</li> <li>4. If you have COVID-19, where would you like to be managed?</li> </ol>
<b>Perceptions</b>	<p>State whether you agree or disagree on the following statements, and why.</p> <ol style="list-style-type: none"> <li>1. I will be ashamed if I have COVID-19.</li> <li>2. I will look down on myself if I have COVID-19.</li> <li>3. I will look down on others if they have COVID-19.</li> <li>4. People will look down on my family/relatives if I have COVID-19.</li> <li>5. It would be a problem to my children if I have COVID-19.</li> <li>6. People will stay away from me if I have COVID-19.</li> <li>7. If I have COVID-19, I should stay away from other people first.</li> <li>8. I will not tell anyone if I have COVID-19.</li> <li>9. If I have COVID-19, I will also infect and spread the virus to others.</li> </ol>

**Focus Group Discussion and Key Informant Interview of Obstetric Health Professionals**

FGDs and KIIs of 20 chosen obstetric health professionals consisting of OB-GYNs, GPs, nurses, and midwives were also conducted. The participants’ characteristics (sex, age, profession, and years of experience) were first obtained followed by three rounds of discussion until the moderator deemed that idea saturation was already reached. The guide questions were the following:

1. How many patients with COVID-19 have you seen? What are their presentations?
2. How would you talk about perinatal exposure to COVID-19?
3. What are the concerns of the COVID-19 (+) mothers about their pregnancy? How about the COVID-19 (-) mothers?
4. What factors are likely to interfere with the exposure perception at the time of the interview?
5. What factors are likely to influence a change in behavior concerning exposure?

**Data Analysis**

All the recorded IDIs and FGDs were transcribed and anonymized. The transcripts were translated into English and compiled for coding carried out in NVivo 12. A thematic map

analysis was then generated based on the results of all relevant statements answering or related to the research question.

### Ethical Considerations

The University of the Philippines Manila Research Ethics Board (UPMREB) approved this research with registration code UPMREB 2020-268-01. The board abides by the ethical guidelines on research as provided by the national guidelines prepared by the Philippine Council for Health Research and Development. This study was also registered with the Philippine Health Research Registry with ID number PHRR 200604-002695.

All participants were fully informed about the conduct of the study. We complied with the data protection plan as required by the NEGHR 2017 and the Data Privacy Act of 2012.

## RESULTS

### Sociodemographic Profile

Eighty participants were included in the study. None of the recruited respondents were excluded or withdrawn from the study. All participants are residents of NCR, with most of them seeking medical care at the UP-PGH. Tables 2–5 show the demographics according to participants' grouping at first consultation. Most participants came from the PGH pay section and those having teleconsultation.

### Themes and Subthemes

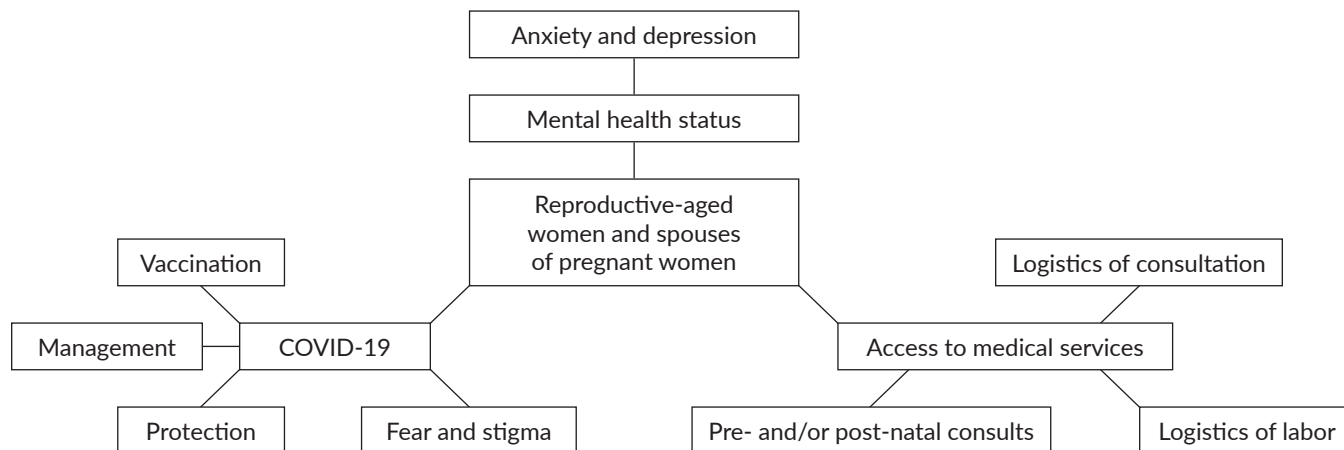
The resulting themes and subthemes were incorporated into a thematic map grouped into the views of women of reproductive age, spouses of pregnant women (Figure 2) and obstetric healthcare professionals (Figure 3).

### Knowledge

All participants (n = 60) for the IDIs were informed and knowledgeable about COVID-19. They acquired information mainly from social media, news, and academic platforms.

**Table 2.** Profile of pregnant women of reproductive age

	No. (%)
<i>Age (mean, range)</i>	30.4 years old, 22-37 years old
<i>Civil status</i>	20 (100%) Married
<i>Highest educational attainment</i>	1 (5%) High school graduate 13 (65%) College graduate 6 (30%) Post-graduate
<i>Profession</i>	3 (15%) Housewife 3 (15%) Private employee 1 (5%) Government employee 2 (10%) Self-employed 3 (15%) Nurse 2 (10%) Nurse attendant 2 (10%) Pharmacist 4 (20%) MD
<i>Gravidity</i>	8 (40%) Primigravida 12 (60%) Multigravida
<i>Parity</i>	10 (50%) Primipara 10 (50%) Multipara
<i>Age of gestation (AOG) at time of interview</i>	1 (5%) First trimester (1-12 weeks) 3 (15%) Second trimester (13-28 weeks) 16 (80%) Third trimester (29-40 weeks)
<i>COVID-19 test result via RT-PCR test</i>	10 (50%) COVID-19 positive 10 (50%) COVID-19 negative
<i>Symptoms presentation</i>	4 (20%) Asymptomatic 2 (10%) Fever 2 (10%) Cough 3 (15%) Sore throat 1 (5%) Anosmia 1 (5%) Difficulty of breathing 1 (5%) Vaginal bleeding 9 (45%) None, for screening purposes only
<i>Mode of delivery</i>	13 (65%) Spontaneous vaginal delivery (SVD) 6 (30%) Caesarean section (CS) 1 (5%) Dilation and curettage (D&C)
<i>Term</i>	18 (90%) Full term 2 (10%) Preterm
<i>Presence of complications</i>	18 (90%) None 1 (5%) Prematurity 1 (5%) Spontaneous abortion



**Figure 2.** Thematic map for women of reproductive age and spouses of pregnant participants.

**Table 3.** Profile of partners of pregnant women of reproductive age

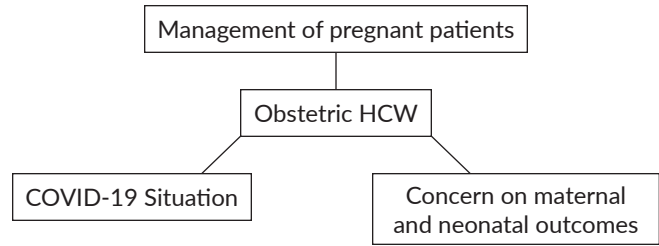
	Profile
Age (mean, range)	31.7 years old, 27-37 years old
Civil status	20 (100%) Married
Highest educational attainment	20 (100%) College graduate
Type of employment	5 (25%) Self-employed 7 (35%) Private employee 8 (40%) Government employee

**Table 4.** Profile of non-pregnant women of reproductive age

	Profile
Age (mean, range)	31.05 years old, 24-44 years old
Civil status	11 (55%) Single 9 (45%) Married
Highest educational attainment	3 (15%) High school graduate 13 (65%) College graduate 4 (20%) Post-graduate
Profession	2 (10%) Self-employed 3 (15%) Private employee 2 (10%) Government employee 4 (20%) MD 5 (25%) Nurse 2 (10%) Physical therapist 2 (10%) Medical technologist
Gravidity	3 (15%) Nulligravida 6 (30%) Primigravida 11 (55%) Multigravida
Parity	3 (15%) Nullipara 4 (15%) Primipara 13 (65%) Multipara
COVID-19 test result via RT-PCR test	10 (50%) COVID-19 positive 10 (50%) COVID-19 negative
Symptoms presentation	6 (30%) Asymptomatic 1 (5%) Fever 1 (5%) Cough 2 (10%) Anosmia 1 (5%) Ageusia 10 (50%) None, for screening purposes only

**Table 5.** Profile of obstetric health professionals

	Profile
Age (mean, range)	36.75 years old, 25-61 years old
Sex	18 (90%) Female 2 (10%) Male
Profession	12 (60%) OB-GYN 7 (35%) Nurse 1 (5%) Midwife
Years of experience	15 (75%) < 10 years 1 (5%) 10-20 years 4 (20%) > 20 years



**Figure 3.** Thematic map for obstetric health professionals.

Participants reported COVID-19 being a highly infectious disease that spreads through droplet transmission, with symptoms such as loss of smell and taste, cough, colds, sore throat, or fever. Participants also stated that they observed the COVID-19 minimum health protocols such as frequent handwashing, physical distancing, avoiding going to public places as much as possible, and wearing a face mask and shield to avoid exposure to COVID-19. There were no significant differences in sources of information across demographic groups.

Pregnant Women

There was no difference in the knowledge on COVID-19 between COVID-19 positive and negative groups. Both groups had no concerns on the possible neonatal effects and complications that might be attributed to COVID-19. However, symptomatic COVID-19 positive patients (n = 6) expressed fear and anxiety compared to asymptomatic patients (n = 4), and those who underwent COVID-19 testing for screening purposes only (n = 10). Majority of the recruited pregnant women were HCWs (n = 1) and had more exposure risk. They expressed their willingness to be vaccinated especially but had some concern as to its effects on their unborn child.

Spouses of Pregnant Women

The spouses (n = 20) of pregnant women interviewed also had a fair knowledge of the COVID-19 virus. They shared that they needed to be knowledgeable about it so that they know how to protect themselves, especially their pregnant wives. All spouses were also willing to be vaccinated as they recognized the importance of the vaccine not only for themselves but also for their families and relatives.

*“Of course having a vaccine would help. If they can provide for everyone as soon as possible, that would be better so that we can return to before COVID-19 happened...” - Spouse 1*

Non-pregnant Women

There was also no difference in knowledge on COVID-19 between the COVID-19 positive and negative women. Most of the participants (n = 16) in this group only underwent swab testing for work or travel purposes, and six of them were found to be asymptomatic. The COVID-19 positive

subgroup generally had no pressing concerns as four of them only manifested mild symptoms, while six participants were asymptomatic. However, they were aware of the risks and still continued to observe precautionary measures, and also had positive responses regarding vaccination.

**Practices**

**Pregnant Women**

Most of the participants in the pregnant group were HCWs (n = 11). Of the other nine participants, three were housewives, six were employed but four were working from home. For the non-HCWs, they stated that they only went to hospitals or clinics for their prenatal checkups and avoided going out of their residences as much as they could. Initial prenatal checkups were done by teleconsultation and the average number of face-to-face consults for pregnant women was 3.5 for the entire pregnancy. Pregnant women were more careful and would immediately consult their physicians for appropriate management if they started to feel any of the COVID-19 symptoms. They were also anxious about the current situation since they needed to be more careful because of the additional risk to their pregnancy. COVID-19-positive participants were managed either in their homes (n = 9) except for one participant who experienced difficulty of breathing that warranted appropriate medical supervision.

**Spouses of Pregnant Women**

As spouses of pregnant women, they were mainly in charge of the errands that required them to go out of the house. All were aware of the risk brought by this task and were cautious not to be infected and to pose a threat to their families. One respondent reported that he had to take a bath at their garage before entering the household.

*“We already set-up a shower area in our garage so whenever we go home when we do errands, we bathe first in the garage.” – Spouse 2*

The participants reported managing the common symptoms of COVID-19 with over-the-counter medicines first unless they had a known exposure, which would warrant COVID-19 testing. They would also immediately observe precautionary isolation while waiting for the test results so as to protect their families. Almost all spouses were tested mainly because they would be in close contact with their COVID-19-positive wives or they needed to accompany their COVID-19-negative wives during childbirth.

**Non-pregnant Women**

All participants in this subgroup were part of the workforce, and most were not in a work-from-home setup. With this, they reported the need to practice additional measures to protect themselves. The participants who were not HCWs (n = 15) were not specifically keen on having COVID-19 testing immediately as this was an additional expense and would implicate the need to stop from work.

*“The COVID-19 will be another source of expense. I am not in a work-from-home set-up. I still go out every day and I am exposed. If I feel like I have symptoms, getting tested is another expense on top of my usual expenses already. I would rather stay at home and not go out.” – Woman 1*

When asked about their actions if they are confirmed to have COVID-19, all participants reported immediately doing isolation or quarantine and would inform possible close contacts about their condition. With the current situation of the healthcare facilities, most of the participants preferred to quarantine in their households as much as they can as they generally felt safer with their relatives.

Table 6 shows the breakdown of scores for the practices' component of the IDI.

**Table 6.** Breakdown of responses for practices component

Questions	Responses	Pregnant women (n=20)	Non-pregnant women (n=20)	Spouses of pregnant women (n=20)
<b>How often do you go to a clinic or hospital for your prenatal check-up/ consultation?</b>	0	0	-	-
	At least once a month	0	-	-
	1-2x during each trimester	20	-	-
<b>What would do if you think you are infected with COVID-19?</b>	None	0	0	2
	Undergo quarantine or isolation	20	12	10
	Consult medical doctor	20	8	14
	Undergo COVID-19 testing	17	6	12
<b>To whom will you go or consult if you have COVID-19?</b>	None	0	0	0
	Barangay health worker (BHW)	0	0	0
	Nurse	0	0	0
	Medical doctor	20	20	20
<b>If you have COVID-19, where would you like to be managed?</b>	Will not seek medication	0	0	0
	House	18	17	17
	Hospital	2	5	3

Perceptions

Pregnant Women

Participants who tested positive for COVID-19 felt shamed and stigmatized. They worried that they might have infected their families and offspring. Two respondents who were symptomatic reported that they initially did not want to report their symptoms. Those who were positive had apprehensions on whether they would be accepted by facilities for childbirth.

*“I did not want to report that I was having symptoms already. It’s scary because I don’t know if I will be treated if they know I have fever and coughs.”*  
– Mother 1

Another issue that was raised by COVID-19-positive pregnant women was their ability to care for their newborns including *Unang Yakap* and breastfeeding.

*“COVID is scary because I don’t know if I can hold my baby after childbirth. I might even transfer the disease if I breastfeed my baby. Of course, I don’t want to be the one spreading the disease.”* – Mother 2

Spouses of Pregnant Women

The spouses reported great concern regarding their exposure to the infection as they may be a burden to their families.

*“I don’t want to be the one to infect my family. I’m the only one who can take care of my family.”* – Spouse 5

Mainly, as heads of their families, they were worried about who would be taking care of the children and their spouses. Another concern is the actions that have to be taken in order to minimize the spread of the virus in their own household. They reported that if they would be suspected of being infected, they would immediately practice stricter health measures to protect everyone in their household.

*“A lot of things have changed, a normal runny nose is already scary. Even allergies are hard to discern, so with our family, once you have even the cold we already isolate.”* – Spouse 3

The need to contact other caregivers for their children was also raised by two respondents.

Non-pregnant Women

COVID-19-positive participants felt shame and stigma after contracting the virus. They responded that they would want to keep the information to themselves or to their immediate families as they were scared of the opinions of their neighbors if they learned that there was a confirmed case in their community.

*“I don’t want to inform others, even my family, because people gossip easily. I already know what to do if I have symptoms, so I’d rather keep it to myself and isolate.”* – Woman 2

However, all participants seemed to know the appropriate steps upon learning that they were either suspected or confirmed COVID-19 patients, such as performance of isolation or quarantine and observance of stricter COVID-19 health measures. All participants stated that they would not be biased or have a stigma against people who unfortunately had COVID-19.

Table 7 shows the breakdown of scores for the perceptions’ component of the IDI.

**Obstetric Healthcare Professionals**

The HCWs talked about their experiences in providing care to obstetric patients with the current situation. They shared that the recent surge had been worse due to an increase in the number of admissions of patients with severe or critical cases. These patients are either in their second or third trimester and sometimes in already bad prognoses and complications due to more difficult access in seeking care. One participant shared that COVID-19 positive pregnant

Table 7. Breakdown of scores for perceptions component (N=60)

Pregnant Questions	Pregnant women (n=20) No. (%)		Spouses of pregnant women (n=20) No. (%)		Non-pregnant women (n=20) No. (%)	
	Agree	Disagree	Agree	Disagree	Agree	Disagree
<i>I will be ashamed if I have COVID-19.</i>	15 (75)	5 (25%)	9 (45%)	11 (55%)	14 (70%)	6 (30%)
<i>I will look down on myself if I have COVID-19.</i>	12 (60%)	8 (40%)	3 (15%)	17 (85%)	12 (60%)	8 (40%)
<i>I will look down on others if they have COVID-19.</i>	0 (0%)	20 (100%)	0 (0%)	20 (100%)	0 (0%)	20 (100%)
<i>People will look down on my family/ relatives if I have COVID-19.</i>	11 (55%)	9 (45%)	12 (60%)	8 (40%)	13 (65%)	7 (35%)
<i>It would be a problem to my children if I have COVID-19.</i>	20 (100%)	0 (0%)	20 (100%)	0 (0%)	10 (50%)	10 (50%)
<i>People will stay away from me if I have COVID-19.</i>	20 (100%)	0 (0%)	20 (100%)	0 (0%)	20 (100%)	0 (0%)
<i>If I have COVID-19, I should stay away from other people first.</i>	20 (100%)	0 (0%)	20 (100%)	0 (0%)	20 (100%)	0 (0%)
<i>I will not tell anyone if I have COVID-19.</i>	0 (0%)	20 (100%)	0 (0%)	20 (100%)	11 (55%)	9 (45%)
<i>If I have COVID-19, I will also infect and spread the virus to others.</i>	0 (0%)	20 (100%)	0 (0%)	20 (100%)	0 (0%)	20 (100%)

mothers have complications such as acute respiratory failure which sometimes warrants intubation, especially for patients with other comorbidities such as pre-eclampsia, diabetes, and respiratory conditions. As for COVID-19 negative patients but with maternal complications due to late presentation, they usually deal with late deceleration, non-reassuring fetal status, and preterm delivery. Depending on the COVID-19 status of the patients, hospital protocols are adjusted for their safety. However, they observed that some of the other HCWs have also been lax leading to an increase in infection rates in the different departments. Swab testing among them has also decreased and is now only limited to those with significant exposure to COVID-19.

The pregnant mothers were fairly knowledgeable about COVID-19. Their main concern was about their delivery. For COVID-19 positive mothers, they are mostly concerned if they or their partner would be able to see their baby upon birth. For COVID-19 negative mothers, their main concern is looking for a facility where they can safely give birth. Pregnant patients generally refuse to be assessed in the outpatient department of UP-PGH as they will be mixed with other patients who are unsure of their COVID-19 status. UP-PGH has been the patients' last resort as it is a designated COVID-19 referral center and they have no other options in going to other facilities due to either lack of vacancies, or absence of COVID-19 swab test results, or hospitals are also not confident in admitting these patients.

The HCWs' methods in providing care had also adapted to the present circumstances. Service provision in UP-PGH is mainly through the Online Consultation Request and Appointment System. The OB-GYN residents reported that they still do their best to provide holistic care to patients even through telehealth, incorporating health education during prenatal consults of their patients. Referring patients to other facilities has been a challenge for them due to a lack of resources or patients not giving their consent to be assessed in the outpatient department in the first place. As a result, most of the high-risk patients still end up under their care.

*"I think it's stressful. I feel like I am easily exposed and I am not as protected and I'm not even on you know, the front lines as far as working somewhere where I'm exposed to it all the time. I might even be bringing the virus home." – HCW 1*

Lastly, the HCWs imparted their thoughts on the effect of COVID-19 in their personal lives. Providing care has been a more demanding task even though they have generally less patients, as they need to be more careful to not contract the disease. They also expressed their anxiety about their COVID-19 status, especially if they are asymptomatic and unknowingly have been passing the virus to their family and relatives. The OB-GYN residents also shared about their lack of experience and skills and the feeling of inadequacy brought about by the lack of learning opportunities due to the pandemic. Despite all these concerns, they reiterated

their unwavering commitment in providing the best service for their patients.

## DISCUSSION

### Interim Guidelines in Managing COVID-19 Pregnant Patients

Findings from this study show that all participants had adequate knowledge about the disease, its epidemiology, and the minimum public health measures needed to prevent transmission. HCWs have technologically adapted to provide maternal and neonatal care with the ongoing pandemic. Participants have shared their experiences using online platforms and pre-scheduled consultations, which is aligned with the recommendations of the different organizations and government advisories. The Philippine Infectious Diseases Society for Obstetrics and Gynecology, Inc. (PIDSOG) has issued an advisory on preventive measures for both pregnant and non-pregnant women which is similar to the guidelines presented to the general public by the DOH and by the international guidelines such as COG and CDC. These steps include, among others, handwashing, cough etiquette, avoidance of touching the face, social distancing, avoidance of unnecessary travel, and self-quarantine.<sup>14</sup>

A woman who is a confirmed COVID-19 case and not in labor is advised to be admitted in an isolation room and to observe infection control guidelines while monitoring maternal and fetal status. In mild cases, the mother may be discharged and home quarantined for 14 days. The DOH released interim guidelines on COVID-19 management of pregnant women, women about to give birth, and newborns to properly guide maternal and neonatal services.<sup>15</sup> When a woman is a confirmed COVID-19 case and in labor, immediate admission and identification of a COVID-19 team consisting of an obstetrician, pediatrician, anesthesiologist, and nurse, is recommended. These professionals should adhere to proper infection control guidelines.<sup>16</sup> The American College of Obstetricians and Gynecologists (ACOG) has also set specific measures for an outpatient assessment and management of pregnant women with suspected or confirmed COVID-19. ACOG categorizes each pregnant woman with suspected or confirmed COVID-19 cases as low, moderate, or severe risk. The first category suggests home quarantine with regular monitoring of maternal and fetal status. The remaining two categories warrant admission to a facility with an isolation room and to perform a physical examination and laboratory tests such as pulse oximetry, chest x-ray, and arterial blood gas.<sup>17</sup>

### COVID-19 and Maternal and Neonatal Outcomes

The results showed that most pregnant women who tested positive for COVID-19 did not have adverse outcomes as most of them were asymptomatic or had mild symptoms during the third trimester. In addition, most participants in the study were knowledgeable and educated regarding



the proper management of the virus. They were aware of the signs and symptoms to watch out for and contact their health care provider for the appropriate management. Most of the participants also preferred home-based isolation and treatment rather than hospitalization. Selim et al. reported that pregnancy does not increase the risk of acquiring COVID-19 and it does not worsen the outcome for the mother nor the baby.<sup>17</sup> Most COVID-19-positive pregnant women recover without the need of a hospital covering approximately 90% of the population.

They have identified that during pregnancy, the immune response of the mother leans to provide more resistance to COVID-19 through the attenuated expression of ACE-2. However, some pregnant patients with severe COVID-19 present with laboratory findings similar to cytokine release syndrome or COVID-19 storm, which poses a greater threat to the mother. In cases of symptomatic pregnant patients, they can present with rapid clinical deterioration and possibly death as compared to symptomatic nonpregnant women of reproductive age. Pregnant women older than or equal to 35 years of age, who are obese, and have hypertension, diabetes, or other comorbidities increase the risk for severe COVID-19 and death in pregnancy. Around 0.15 to 8.0% are attributed to maternal deaths related to COVID-19. Pregnant women who acquired COVID-19 have worse symptoms compared to nonpregnant women of the same age. In addition, in another study by Lokken et al. (2021), pregnant women had a higher risk of acquiring COVID-19 compared to adults of the same age.<sup>18</sup>

There was no miscarriage among the participants of the study. The risk of miscarriage and stillborn for pregnant patients with COVID-19 currently shows there is no increased risk; however, there are limited data on first and second-trimester infection rates.

In two cases of pregnant women with coronavirus, they had preterm labor without other complications. This may be associated with their knowledge of the condition and their constant consultation with their doctors as all the participants had one to two consultations during their term. Preterm birth has been shown to have increased in most studies. This is more evident for pregnant patients with severe or critical diseases. The symptoms that contribute to increased preterm births are fever and hypoxemia as they increase the risk of preterm labor, premature rupture of membranes and abnormal fetal heart rate. However, preterm labor may also occur in patients without severe respiratory symptoms. There are also increased caesarean delivery rates during the pandemic. This is associated with the mother's perception of caesarean delivery being safer than normal delivery. However, this hypothesis and bias lack evidence.

### **Sex Disaggregation and Profession**

Fifty-five percent of the pregnant women who had COVID-19 were HCWs. Their profession and understanding of the matter are positive factors that contributed to their

outcomes. Based on the results, most participants were knowledgeable regarding the protocols when a person-under-investigation (PUI) or is already COVID-positive. Health care workers were also highlighted as a population that are likely to be infected by COVID-19 because of occupational exposure. In a study by Kim et al. (2020), out of 2,842 participants, 6.8% of the participants who were infected with COVID-19 were HCWs.<sup>19</sup> They were mostly women (61%). Most of the HCW were also younger than the non-HCWs. They also presented with milder symptoms and did not require hospitalization and medical intervention for the disease.

In a systematic review by Bandyopadhyay et al. (2020), in a total of 152, 888 cases and 1,413 deaths, most of the infections were found to be women (71.6%) and from the nursing profession (38.6%).<sup>20</sup> However, most of the deaths were seen in men with 70.8% of the population and within the physician group (51.4%). These data follow the worldwide trend, wherein higher severity is more seen in men than women.

The context of women, their age, profession, and pregnancy status, affect their risk of acquiring the disease. In a WHO-China Joint Mission investigation, 147 pregnant women, both suspected and confirmed COVID-19, were tested; 8% had severe disease and 1% were in critical condition (14% severe, 6% critical for the overall population).<sup>21</sup>

### **COVID-19 Vaccine and Pregnancy**

All the participants are aware of the benefits of the vaccine for mothers. Currently, there is no strong evidence on the use of vaccines among pregnant women and women who want to have children. Current studies regarding mRNA vaccines show that, on animal tests, these vaccines do not affect fertility or result in problems with pregnancy. In humans, there are mRNA vaccines that are safe to use and are advised for use in pregnancy as they can affect the immunity of the baby through the placenta. In another variant of the vaccine, they use modified version of the virus. This modified adenovirus cannot spread and hence will not pose a severe threat. This type of vaccine does not affect fertility or pregnancy in animal tests. However, it is still common to have side effects such as fever, dizziness, and malaise. There may be no exact data on the safety and use of vaccines for pregnant women in the small population where the vaccine was used. There are no reports of severe adverse effects and whether the vaccines affect the pregnancy.<sup>22,23</sup>

### **Mental Health during the COVID-19 Pandemic**

The results show that most pregnant women (55%), their spouses (60%), and non-pregnant women (65%) believed that people will have a negative bias towards them for having COVID-19. Also, 100% of pregnant women and their spouses, and 50% of non-pregnant women believe that they may spread the disease to their children and offspring that affects their mental health. All the participants believe

that they must isolate themselves if they have symptoms. Another issue that mothers had that affects the MH was the concern of whether birthing facilities would accept them. There were also changes within the family dynamics so that they may follow the precautions and protocols such as bathing in the garage before entering the house. Health care providers also shared their thoughts on their MH during the pandemic. They expressed their anxiety and how the general decrease in patients affected their learning and financial capabilities. Because of the infection, there was also a paucity in the supply of HCWs who attended to the patients, leading to a feeling of overwork.<sup>24</sup>

In a systematic review by Vizheh et al. (2020), they reported a significant prevalence of anxiety (range, 24.1%, 67.55%), depression (12.1%, 55.89%), and stress (29.8%, 62.99%) among health workers. The HCW groups most affected by MH issues were the nurses, females, workers, and front-line HCW especially those in high infection risk areas. Based on the data above, women who were in the medical professions were at a higher risk for both COVID-19-related illness and MH issues such as depression and anxiety. This was further compounded if the said health professional was pregnant or postpartum. Multiple researchers have reported that pregnancy could be associated with a higher risk for depression, anxiety, and negative affect. The response to the pandemic, although it can improve the COVID-19 outcomes, can indirectly have negative effects on the mother's MH, as the main practice during the pandemic leads to increased isolation, lack of feeling of freedom, and health and financial concerns.<sup>25</sup>

Personal management of MH issues was also advised such as relaxation exercise, and cognitive behavioral management training is also promoted to improve one's MH. This was supported by organizational change such as task restructuring, decreasing job demands, and increasing manpower to promote a better work environment. There were shifts in management to further protect more vulnerable populations without removing their capacity to work. An example of government management in resolving MH issues among HCW was a subsidy for caretakers of the HCW's children and creating a childcare center for the children of HCWs, which created a more sustainable response to the needs of HCWs.<sup>26,27</sup>

## CONCLUSION

This study provided insights on KPP on COVID-19 of women of reproductive age and shed light on the views of HCWs in providing care to these patients during the pandemic. The effects of COVID-19 are still detrimental and highly evident from the micro to the macro level. For an individual, COVID-19 adversely affects physiological and mental health. Further research is currently being done to shed more light on understanding the impact of COVID-19 on women's reproductive health.

## Recommendations

As this is only a single site study, making generalizations would be difficult at this time. Covering other types of health facilities and other locations would provide a different perspective and new insights on how COVID-19 statistics affect the KPP of women of reproductive age in the other specified areas.

## Limitation of the Study

Due to the tight timeline of this study, participants were limited to mostly HCWs in PGH and patients and spouses in the pay ward. This may not be representative of the whole population of patients in PGH; however, as this is a pilot study, this may be used as a jumping point for further research in the same field.

## Acknowledgment

The authors would like to acknowledge the contributions of Krizia De Leon, PTRP for editorial assistance.

## Statement of Authorship

All authors contributed in the conceptualization of work, acquisition and analysis of data, drafting and revising and approved the final version submitted.

## Author Disclosure

All authors declared no conflicts of interest.

## Funding Source

The study has no funding support.

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