Pregnant Women's Performance toward the COVID-19 Pandemic in El-Minia City

Gehan Mohammed Abdelazim[1], Ekbal Abd ELrehim Emam [2], Amany Hassan Abd Elrahim[3]

1. B.Sc. in Nursing, Minia University, Egypt.
2. Professor of Woman Health and Obstetrics Nursing, Faculty of Nursing. Minia University, Egypt
3. Assistant Professor of Woman Health and Obstetrics Nursing, Faculty of Nursing. Minia University, Egypt.

Abstract:

Background: Pregnancy-related changes in physiology, mechanics, and immunology may have an impact on the susceptibility to as well as severity of COVID-19. Moreover to the direct effect of COVID-19 on outcomes of the pregnancy, **so the research aimed to assess** pregnant women's performance toward COVID-19 pandemic. **Design:** Descriptive cross sectional. **Sample:** A convenience sample was utilized to select women in reproductive age (150 women). **Setting:** This research was carried out at outpatient clinic of Obstetrics and Gynecology at Dermawas Central Hospital. **Data collection tools:** Three tools were utilize in the current research, **Tool (I)** composed of three parts, sociodemographic data, obstetric history knowledge related to COVID-19 and it composed of 43 questions, **Tool (II)** was attitude and it consisted 20 Likert scale questions, and **Tool (III)** was pregnant women's precaution practices toward the COVID-19 and it consisted 13 Likert scale questions. **Results:** the findings revealed that 62.0% of the participants had poor knowledge, 66.7% of them had a positive attitude, and 73.3% of them had satisfactory practices; there were a positive correlation between the total knowledge, and attitude as well as precautions practices of the participant pregnant women with statistically significant differences. **Conclusion:** The knowledge, attitude, as well as practice (KAP) survey offer a suitable framework for assessing current initiatives as well as knowing successful social behavior change strategies. **Recommendations:** Conducting a study on another geographical area and apply an educational program to know the impact of it on pregnant women KAP toward COVID-19

Keywords**:** COVID-19 Pandemic, Performance, Pregnant Women's

Introduction

The pandemic of coronavirus (COVID-19), a rapidly spreading an infectious condition that has defined the modern era's worldwide health catastrophe, has presented the globe with a challenge unlike any other. On January 30, 2020, the World Health Organization (WHO) formally designated it a worldwide public health crisis of international significance. A highly contagious virus, it spread rapidly and unexpectedly outside of China in December 2019 to the rest of the world **(Sohrabi et al., 2020).** Now that there have been over two million fatalities worldwide, the human family is bearing a heavy, nearly insurmountable load of loss. There were 114,209,481 confirmed cases reported globally as of the writing on February 27th, 2021, with a mortality rate of 2,643,673 **(WHO 2021).**

This illness is caused by a family of viruses that are zoonotic in origin yet continue to pass from person to person, resulting in a variety of symptoms that can rank in intensity from very minor to major and even fatal. Fever, coughing, myalgia, dyspnea, headaches, and diarrhea are common signs, and they can proceed to pneumonia and serious failure. A few examples of aberrant tests include lymphopenia, thrombocytopenia, leukopenia, as well as abnormalities in chest radiographic imaging. Additionally, higher C-reactive protein as well as lactate dehydrogenase levels **(Rasmussen et al., 2021)**

This infectious disease is distinguished by fast transmission by respiratory droplet, handshake, as well as fecal-oral, with an incubation time from two to fourteen days. Asymptomatic patients who have normal chest computed tomography and no clinical symptoms can nevertheless transmit COVID-19, making it difficult to stop the disease's spread. Observing that COVID-19 can be spread by aerosols and can linger infectiously on surfaces for up to seven days makes the situation considerably worse**(Mustafa, 2020 &Degu et al., 2021).**

Although everyone is susceptible to infection, a pregnant woman may be higher susceptible to COVID-19 infection than a woman who is not pregnant due to her hormonal and physiological changes during pregnancy **(Anikwe et al., 2020).** Fifty percent of pregnant women experience late-trimester upper respiratory congestion caused by higher oestrogen levels, which typically manifests as a moderate upper respiratory illness. These symptoms could be COVID-19 infection signs, making it more difficult to diagnose the condition during pregnancy **(Taha et al., 2020).**

Recent studies have demonstrated a considerable rise in severe maternal and neonatal problems during pregnancy, including spontaneous abortion, hypertension, premature birth, fetal distress, and intrauterine growth restriction. Additionally, a COVID-19-positive pregnant woman is more probable to be predisposed to greater morbidity as well as even mortality because of cytokine storm-related COVID-19 infection, which can significantly worsen fetal brain development **(Musa et al., 2020).** Surprisingly, according to the (CDC) Centers for Disease Control and Prevention report, women who have COVID-19 during pregnancy are approximately triple the likelihood to be hospitalized to (ICU) intensive care units as well as put on a ventilator than women who do not have the condition **(Wan, 2020)**

According to the ministry of health and population (MOH), Egypt is one of the five nations documented the largest number of COVID-19 infections in Africa, with a number of 182,424 confirmed cases as well as 10,688 fatalities as of February 28th, 2021 **(Radwan, 2020 & Worldometer. coronavirus/EGYPT. 2021).** The 1st verified COVID-19 incidence in Africa was announced by Egypt on 14' February 2020 **(Africa news, 2020).** Urban areas in the Greater Cairo region were documented the highest number of

COVID-19 patients, as was to be expected. **(Robert and Beschel, 2021).**

Based on the WHO recommendations, the national government of Egypt has made outstanding efforts to conflict the COVID-19 crisis. During the second wave, these efforts involved adhering to preventive measures like maintaining social distance, donning masks, practicing good hygiene, and avoiding crowded places.

Notably, Egypt's MOH has advised women to delay pregnancy due to the coronavirus. To give everyone access to tools and information on COVID-19, the government created online education, a 24-hour helpline, and a smartphone application. Additionally, prioritize hiring employees with chronic illnesses and those who are pregnant to limit the number of workers in businesses. These recommendations are being reiterated for the sake of public health as well as safety as the government works to prevent a 2nd shutdown as well as its effects on business and economic activities, as job losses (**Maat of Peace, Development, as well as Human Rights, 2020).**

In spite of the fact that official statistics show a 2nd wave, with an increase in daily patients starting in November as well as accelerating to a peak of over 1,400 each day in beginning of January pre the subsequently declining to about 700 each day in end of January, Egyptian prospects has actually significantly enhance compared to the daily case counts tallied over the summer **(Worldometer/EGYPT.2021).**

The COVID-19 pandemic places significant obligations and responsibilities on nurses. They will continue to be on the front lines of the fight against the pandemic disease, making sure that nurses are actively fighting COVID-19 across the globe, raising public awareness, fighting to ensure that the republic's most vulnerable populations have access to the necessary information and communication needs, and instructing them on how to prevent disease transmission and harm to themselves and others **(Phillips & Catrambone, 2020; Nissen, 2020).**

Due to their high-risk status, pregnant women must be aware of COVID-19 world health measures as social withdrawal, always washing the hand, as well as protective equipment use to stop the transmission of the virus. Applying these crucial public health preventative measures improperly could result in bad control and increase a possible infection. Therefore, during this worldwide pandemic, pregnant women demand a more considerate attitude and mutual understanding **(Besho et al., 2021)**

Significance of the study

Obstetricians caring pregnant cases with suspected or proven COVID-19 infection face logistical difficulties and dilemmas due to pregnancy itself. The Royal College of Obstetricians and Gynecologists (RCOG) suggest that the COVID-19 crisis raise the exposure of perinatal depression, anxiety, as well as domestic abuse among expectant women. Therefore, during this worldwide pandemic, professionals and their partners should take a more considerate approach as well as show mutual understanding while treating pregnant women. Also there are few reaches examining public perceptions and attitudes about the impact of COVID-19 among pregnant women. Understanding pregnant women's attitudes about COVID-19 is vital as the COVID-19 crisis spreads across the world. As a result, during the antenatal, intrapartum, and post-partum periods, this will enable doctors to offer pregnant women the proper counselling to alleviate their anxiety as well as concerns about COVID-19 **(Geldsetzer, 2020)** So, the researchers introducing this research attempts to assess the pregnant women's knowledge, attitudes as well as precaution practices toward the COVID-19 pandemic

The study aims

This study was aimed to assess pregnant women's performance toward the COVID-19 pandemic

The studt questions

1. What is the level of pregnant women's Knowledge toward the COVID-19 pandemic?
2. What is the pregnant women attitude toward the COVID-19 Pandemic?
3. What are the Precaution Practices of pregnant women toward the COVID-19 Pandemic?

Subjects and methods

Research's Design

To accomplish the goal of the actual research, a descriptive cross-sectional research approach was utilized.

Data for characterizing the state of phenomena or the connections between phenomena at a specific moment in time are provided by descriptive cross-sectional studies. This can be viewed as a "snapshot" of a condition's prevalence and features in a population at a specific moment in time. A cross-sectional study's inclusion and exclusion criteria are used to guide participant recruitment.

Setting:

This study was carried out at outpatient clinic of Obstetrics as well as Gynecology at Dermawas Central Hospital, El Minia city, Egypt.

Sample type and size:-

Non probability convenience sampling was utilized in the current research. The target population was involved pregnant women attained to the outpatient clinic of Obstetrics as well as Gynecology over six months from August 2021 to the end of January 2022. The number of studied samples was 150 related to these criteria: -

Inclusion criteria

1. Healthy pregnant woman without any medical or obstetric complications.
2. Pregnant woman at any trimester.

Exclusion criteria

1. Women refused to participate in the study.

Tools for Data Collection

To accomplish the goal of the research, 3 tools were utilized in the actual research:

Tool (I): Pregnant women's knowledge regarding COVID-19

It was involved 3 parts:

Part I: Socio-demographic Data, it an interview questionnaire created by the researchers post reading related literatures. It involved: age, occupation, education, economic status, households size and information's source about COVID-19

Part II: Obstetrical history such as: number of gravidity, number of parity, type of current conception, trimester and number of children.

Part III: Pregnant women's knowledge regarding COVID-19

This tool designed by **Yassa et al., (2020),** it translated into Arabic and modified by the researchers to determine knowledge of the pregnant women related to the COVID-19 It composed of 43 questions. Such as: Knowledge related to (definition (K1-K4), source of infection and mode of transmission (K5-K9), risk factors groups, symptoms, and duration of symptoms (K10-K15), protective measures, management and vaccination (K16-K31), knowledge about the COVID-19 crisis related to antenatal, labor as well as postnatal period (K32-K43)

Scoring system

The knowledge section consists of 43 questions. It scored as Yes, no, and don't know answers and given (0, 1, and 2 scores) respectively. The correct answer took 1 score as well as incorrect answer took zero score. The knowledge total score was 43 and categorized as poor knowledge (<60%) (<26 grades), average knowledge (60–<75%) (26-<32 grades), and good knowledge (≥75%) (≥32 grades).

Tool (II): Pregnant women's attitude toward the COVID-19

This tool designed by **Lee et al., (2020)** it was revised by the researchers and translated into Arabic to determine pregnant women's attitude toward the COVID-19. Some modification done by the researchers depend on the Jury Committee opinions. It consisted of 20 questions such as: You think that you should keep a space during social distancing, Going out isn't a concern via the lockdown, Going to market area during the lockdown was not a concern for me, You think that you have to follow any effective non-pharmaceutical interventions, You think you must hear to covid-19 updates, Taking vitamins to control covid-19 is suitable for me, Do you think that health education about covid-19 is important?, Reducing your contact with animals or received preventive measures is very critical to control covid-19, You believe that you have taken all necessary precautions to avoid contracting the coronavirus, You believe that the government has taken appropriate techniques to address the coronavirus outbreak, If asked to self-quarantine, you would adhere to the severe requirements., You were caught having fun while visiting the family., Do you believe COVID-19 will have a detrimental impact on the economy?, You have faith in medical professionals to fight the coronavirus outbreak., and… etc.

The scoring system

The attitude section consists of 20 questions. Also the responses of every item were gathered on 3 points Likert scale as follow disagree, neutral, as well as agree and given (0, 1, and 2 scores) respectively. The total score of attitude was 40 and classified as negative attitude (less 60%) (<24 grades) and positive attitude (≥ 60%) (≥24 grades).

Tool (III): Pregnant women's precaution practices toward the COVID-19

This tool developed by **Lee et al., (2020)** it was revised by the researchers and translated into Arabic to determine pregnant women's precaution practices toward the COVID-19. Some modifications done by the researchers depend on the Jury Committee opinions. It consisted of 13 questions such as: - Do you always put on a mask when you leave the house? How frequently do you engage in social isolation in the wake of the pandemic? How frequently do you isolate yourself by staying at home? How frequently do you cover your mouth and nose when you cough or sneeze with your elbow, a cloth, or a tissue? How frequently do you wash or wipe your hands to sanitize them? How often do you disinfect your home? How often do you sanitize your vegetables? How often do you sanitize your fruits? How often do you disinfect your floors?.....etc.

The Scoring System

Pregnant women's precaution practices toward the COVID-19 were evaluated by using a Likert- scale of five points ranked from Never (0), rarely (1), sometimes (2), Usually (3) and Always(4) Women' total precaution practices score was (52) classified as the following: unsatisfactory precaution practices toward COVID-19 scored (<60%) (<31 grades) and satisfactory precaution practices toward COVID-19scored (≥60) (≥ 31 grades).

Validity of the research tools:

Tools were evaluated for the content validity by a committee jury of five experts' in the field of Obstetrics and Gynecological Nursing as well as essential alterations were done. Additionally the jury was composed of 2 professors and one assistant professors of Obstetrics and Gynecological Nursing, Faculty of Nursing, Minia University also two professors of Community Health nursing from Faculty of Nursing, Minia University. A review of the tools' content covering, format, clarity, phrasing, length, as well as general appearance was requested from each member of the expert panel.

Reliability of the research tools

The tools' dependability was tested to ensure their consistency. The degree to which the questions of the tools measured the same notion and were correlated with one another was determined by the internal consistency utilizing the Cronbach's alpha test, which demonstrated the tools' high internal dependability; and distributed as the next: It was (.935) for 1st tool "knowledge", (.985) for 2nd tool " Attitude" and (.980) for 3rd tool " Practice" Hence, the sheets were highly reliable.

Pilot Study:

A pilot of the research was applied on ten percent of participants as (15) women to determine the tools' simplicity, completeness, as well as applicability as well as to illustrate the proper amount of time required to fill the tools. The pilot research's findings were added to the final results without alteration.

Ethical consideration: -

An official letter was provided by the Dean of the Faculty of Nursing at Minia University, and this study was carried out with the ethical committee's clearance. In this letter, a succinct overview of the study's goals was presented. The Dermawas Central Hospital's director provided his written consent. Participants were reported to that their participation was optional, that they could stop at any moment, that their information would be save confidential,

and that the information would only be used for the current study.

Data Collection Procedure:

- An official letter was granted from the Nursing Faculty Dean at Minia University, Ethical Committee of the Nursing Faculty at Minia University.
- The tools were adopted, and translated into Arabic; then collected the jury approval for the tools to collect data of the study.
- Written approvals were obtained from the director of hospital as well as after explaining the purpose of the study
- Each pregnant woman was interviewed individually on the outpatients' clinics (the resting or 4D examination rooms) to discuss the nature as well as purpose of the research. The researchers explained the objective and sheet to the pregnant women. The pregnant women were given from twenty-five to thirty minutes to responds the entire sheet.
- A pilot study was done to assure scales clarity and applicability.
- Then the reliability of the scales was done.
- Data were collected from 9:00 am to 1:00pm on Saturday and Wednesday from Dermawas Central Hospital from each week for six months during the period from the beginning of August 2021 to finish of January 2022.

Statistical Design:

The data were collated, processed, analyzed, as well as summarized utilizing descriptive statistical tests to assess hypothesis of the research, with SPSS version (IBM 25) as well as Excel for figures. Additionally frequencies and percentages were utilized as descriptive statistics for qualitative variables, whereas means as well as standard deviations were used for quantitative data. When the P-value was $\leq$ to 0.01 and the level of significance was agreed, it was termed very significant. The Fisher exact test / chi test was performed to find a link among women's KAP depend on their socio-demographic variables.

Correlation is a statistical method for determining the nature as well as intensity of the connection between women's KAP. The type of the relationship (positive/negative) is shown by the sign of the coefficient, whilst the strength of the relationship is indicated by the value, as follows: Weak correlation below 0.25, medium correlation between 0.25 and 0.499, moderate correlation between 0.5 and 0.739, as well as strong correlation between 0.740-0.99.

Results: -

Table (1): Distribution of the pregnant women regarding to their demographic data (n= 150).

Demographic data items	No.	%
Age/ year		
20-30 years	96	64.0
31-40 years	43	28.7
>40 years	11	7.3
Mean ± SD	29.5 ± 6.5	
Occupation of the woman		
Housewife	100	66.7
Worker	50	33.3
Education		
Illiterate	33	22.0
Read and write	25	16.7
Primary or preparatory	27	18.0
Secondary	50	33.3
University	15	10.0
Economic status		
Low	52	34.7
Moderate	95	63.3
High	3	2.0
Household size		
Narrow	96	64.0
Wide	54	36.0

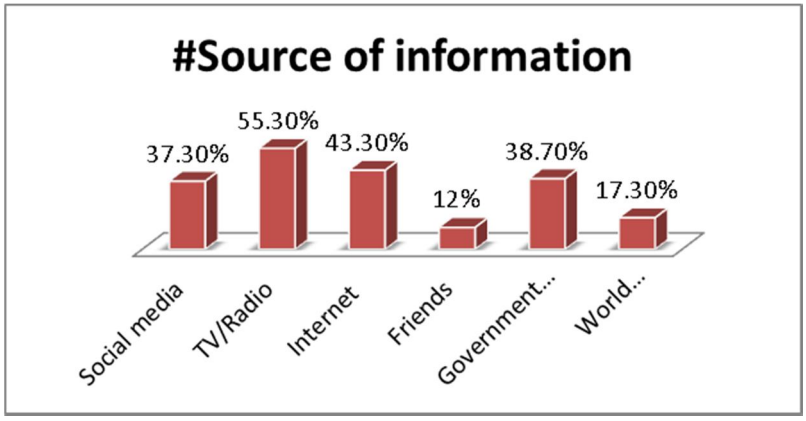
Table (1): illustrates distribution of the pregnant women according to their demographic data. It shows that 64.0% of the studied pregnant women aged between 20 to 30 years with mean age 29.5 ± 6.5 years. Concerning the occupation and education, 66.7% were housewives and 33.3% had secondary education respectively. 66.7% and 64% had moderated economic status and narrow household size respectively.

Table (2): Distribution of the pregnant women related to their Obstetrical history (n= 150).

Obstetric history	No.	%
Gravidity number		
Primigravida	65	43.3
Multigravida	85	56.7
Parity number		
Nullipara	81	54.0
Primipara	31	20.7
Multipara	38	25.3
Conception type		
Naturally conceived	142	94.7
Not naturally conceived	8	5.3
Trimester		
1st ≤12 weeks of gestation	23	15.3

Obstetric history	No.	%
2nd 13:26 weeks of gestation	52	34.7
3rd 27 :40 weeks of gestation	75	50.0
History of abortion		
Yes	16	21.3
No	134	78.7
Number of children		
Zero	85	56.7
1-3	30	20.0
>3	35	23.3

Table (2): illustrates that 56.7% of the pregnant women were multigravida, as well as 54.0% of them were nullipara. 94.7 % of them were naturally conceived. 34.6%, 78.7% and 50.0% of them were in the third trimester, didn't aborted and hadn't no children respectively.



 # More than one answer

Figure (1): Percentage distribution of the pregnant women regarding their source of information toward COVID-19 Pandemic (n = 150)

Figure (1): shows that 55.3% of the pregnant women the most source of information was TV/radio, 43.3% from the internet, 38.3% ministry of health, and 17.3% & 12.0% their sources were world health organization and their friends respectively.

Table (3): Distribution of the pregnant women regarding to their knowledge regarding COVID-19 Pandemic in relation to definition (n= 150).

Knowledge related to definition	Yes %	No %	Don't know %
1. The COVID-19 is real.	83.3	10.7	6.0
2. COVID-19 is an acronym for Coronavirus disease – 19.	22.0	7.3	70.7
3. COVID- 19 is similar to Infectious disease as Common flu or Sars-covid.	71.3	8.7	20.9
4. COVID- 19 caused by viral infection.	66.7	26.0	7.3

Table (3): presents that 83.3% of the studied pregnant women mentioned that COVID is a real disease, 70.7% didn't know the acronym COVID-19, 71.3% mentioned that COVID- 19 is likely to infectious disease such as Common flu or Sars-covid and 66.7% answered that COVID- 19 is caused by viral infection.

Table (4): Distribution of the pregnant women regarding to their knowledge regarding the COVID-19 pandemic in relation to the source of infection and mode of transmission (n= 150).

Knowledge related to the source of infection and mode of transmission	Yes %	No %	Don't know %
5. After coming into contact with an infected person's cough, sneeze, or contaminated surfaces, the COVID-19 infection can be spread by touching the eyes, nose, as well as mouth.	70.3	6.0	23.7
6. COVID-19 is spread from person to person.	25.3	10.0	64.7
7. COVID-19 is a human-to-human virus.	23.3	15.4	61.3
8. Can the source of COVID-19 transmission to humans be determined scientifically?	18.0	22.7	59.3
9. Droplets and aerosols can spread COVID-19.	67.3	12.0	20.7

Table (4): presents that 70.3% of them knew that COVID-19 infection can be transmitted by eye's touching, nose, and mouth after contact with an infected individual when they cough or sneeze or contaminated surfaces. 25.3% of them knew the source of infection is person , 67.3% understood that droplets and aerosols can distribute COVID-19.

Table (5): Distribution of the pregnant women regarding to their knowledge regarding COVID-19 pandemic in relation to risk factors groups, symptoms, and duration of symptoms (n= 150).

Knowledge related to risk factors groups, symptoms, and duration of symptoms	Yes %	No %	Don't know %
10. Everyone is at equal risk of contracting COVID-19.	19.3	11.4	69.3
11. Not all COVID-19 patients will experience severe symptoms. However, those who have underlying or persistent illnesses are more prone to experience severe symptoms.	26.7	9.3	64.0
12. For a period of fourteen days, anyone who comes into contact with someone who has	23.3	8.0	68.7

Knowledge related to risk factors groups, symptoms, and duration of symptoms	Yes %	No %	Don't know %
COVID-19 should be isolated.			
13. Fever or chills, coughing, shortness of breath or difficulty breathing, exhaustion, muscular or body aches, and headache are some of the symptoms of COVID-19.	24.7	7.3	68.0
14. Patients with COVID-19 who have no symptoms can spread the illness.	26.0	8.7	65.3
15. From two to fourteen days after virus exposure, symptoms may start to manifest.	23.3	6.0	70.7

Table (5): presents distribution of the pregnant women according to their knowledge regarding COVID-19 pandemic in relation to risk factors groups, symptoms, and duration of symptoms. It shows that 69.3%, and 70.7% of the studied pregnant women didn't know that if everyone has at equal risk of contracting COVID-19 and the duration of symptoms may start to manifest after exposure to the virus respectively.

Table (6): Distribution of the pregnant women regarding to their knowledge regarding the COVID-19 pandemic in relation to protective measures, management and vaccination (n= 150).

Knowledge related to protective measures, management and vaccination	Yes %	No %	Don't know %
16. COVID-19 infection can be avoided by wearing two masks.	26.7	10.0	63.3
17. Washing hands frequently protect from infection.	24.0	9.3	66.7
18. Wearing facemasks in public areas limits the virus from the spread	24.0	7.3	68.7
19. The optimal distance between two individuals should be 6 feet during social distance.	62.0	13.3	24.7
20. Health care workers should wear N95 masks in hospital all the time.	24.0	2.7	73.3
21. Everyone is required to wear personal protection equipment.	21.3	8.0	70.7
22. We should avoid using public transportation or visiting the crowded areas to prevent COVID-19 infection.	20.0	16.0	64.0
23. People who are sick must be isolated and treated in order to avoid the spread of COVID-19.	24.7	14.0	61.3
24. COVID-19 vaccinations are being tested.	26.0	10.0	64.0
25. Are COVID-19 vaccinations available?	74.0	3.3	22.7
26. The pneumococcal vaccine offers COVID-19 protection.	24.0	6.0	70.0
27. The COVID-19 vaccine protects against severe symptoms.	16.0	7.3	76.7
28. The effectiveness and safety of vaccines against COVID-19 are currently unknown.	20.0	9.3	70.7
29. Treating COVID-19 symptoms with antibiotics, greater fluid intake, and rest.	25.3	14	60.7
30. The majority of patients can recover from the infection with symptomatic and supportive care.	26.0	12.7	61.3
31. COVID-19 cannot be treated at the moment.	23.3	10.7	66.0

Table (6): shows that 76.7% and 73.3% of the pregnant women didn't know that the vaccination against COVID-19 prevents severe symptoms and health care workers should wear N95 masks in hospital all the time. 74.0% of them knew that there were vaccines for COVID-19.

Table (7): Distribution of the pregnant women regarding to their knowledge regarding the COVID-19 pandemic in relation to antenatal, labor and postnatal period (n= 150)

Knowledge regarding the COVID-19 related to antenatal, labor and postnatal period	Yes %	No %	Don't know %
32. Are you aware of the modifications made to maternity units (such as the restriction of visitor access, the use of protective gear, and infection control procedures) to reduce the spread of the coronavirus infection to healthy women and their newborns?	24.0	5.3	70.0
33. Is a pregnant woman more likely than a non-pregnant woman to develop a severe respiratory illness?	26.7	9.3	64.0
34. Pregnancy-related COVID infection is linked to a higher risk of miscarriage	22.7	2.7	74.7
35. A COVID infection during pregnancy increases the likelihood of an early birth.	24.7	6.7	68.7
36. Pregnancy-related COVID infection is linked to an increased risk of congenital deformity	23.3	4.0	72.7
37. The fetus could become infected if a pregnant woman contracts COVID-19.	22.7	6.0	71.3
38. Pregnancies with COVID-19 infection are more likely to have poor third-trimester outcomes.	21.3	5.3	73.3
39. Does the COVID-19 infection influence the method of delivery?	22.7	2.7	70.0
40. After giving birth, is it safe for an infected mom to have close skin-to-skin contact with her child?	18.3	4.0	77.7
41. The likelihood of the virus causing serious illness in newborns is low.	23.3	15.4	61.3
42. For patients with COVID 19 who have mild illness Breastfeeding is safe.	18.0	13.3	68.7
43. If you have COVID-19, will you be quarantined from your newborn for two weeks after delivery?	20.7	12.0	67.3

Table (7): shows that 77.7% of the studied pregnant women didn't know if it is safe for an infected mom to have close contact (skin to skin) with her baby after delivery. 74.7% of them didn't know if COVID infection was associated with increased risk of miscarriage or not.

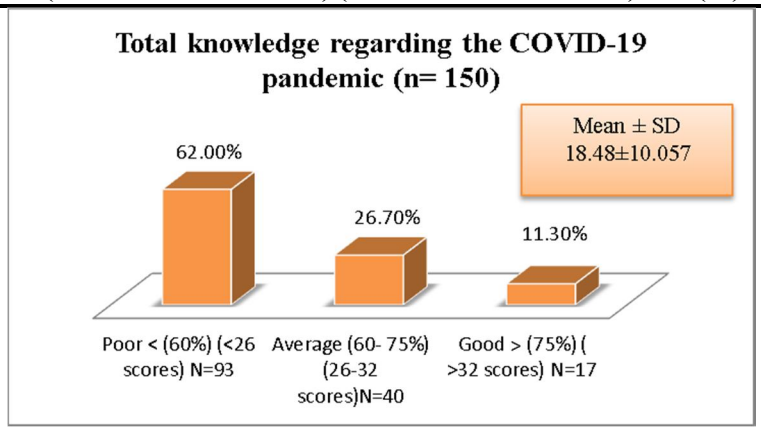


Figure (2): Percentage distribution of the pregnant women regarding their total knowledge levels about COVID-19 Pandemic (n= 150).

Figure (2): reveals that 62.0 % of studied sample had poor knowledge about COVID-19 Pandemic with. Mean ± SD score of their knowledge was 18.48±10.057.

Table (8): Distribution of the pregnant women regarding to their Attitude toward COVID-19 pandemic (n= 150).

Items	Agree		Neutral		Disagree	
	No.	%	No	%	No.	%
1. You think that you should keep a space during social distancing	90	60.0	15	10.0	45	30
2. Going out isn't a concern via the lockdown	47	31.3	52	34.7	51	34
3. Going to market area during the lockdown was not a concern for me	38	25.3	37	24.7	75	50.0
4. You think that you have to follow any effective non-pharmaceutical interventions.	98	65.3	20	13.3	32	21.3
5. You think you must hear to covid-19 updates	111	74.0	15	10.0	24	16.0
6. Taking vitamins to control covid-19 is suitable for me	67	44.7	35	23.3	48	32.0
7. Do you think that health education about covid-19 is important?	115	76.7	5	3.3	30	20.0
8. Reducing your contact with animals or received preventive measures is very critical to control covid-19	62	41.3	41	27.3	47	31.4
9. You believe that you have taken all necessary precautions to avoid contracting the coronavirus	99	66.0	30	20.0	21	14.0
10. You believe that the government has taken appropriate techniques to address the coronavirus outbreak	91	60.7	19	12.7	40	26.7
11. If asked to self-quarantine, you would adhere to the severe requirements.	135	90.0	12	8.0	3	2.0
12. You were caught having fun while visiting the family.	85	56.7	30	20.0	35	23.3
13. Do you believe COVID-19 will have a detrimental impact on the economy?	133	88.7	14	9.3	3	2.0
14. You have faith in medical professionals to fight the coronavirus outbreak.	110	73.3	11	7.3	29	19.3
15. During the coronavirus outbreak, you feel more love and respect for the frontline healthcare professionals.	130	86.7	13	8.7	7	4.6
16. Do you believe that wearing PPE (personal protective equipment) and taking contact avoidance measures can help you prevent catching COVID 19?	71	47.3	45	30.0	34	22.7
17. Are you concerned for your safety?	96	64.0	15	10.0	39	26
18. Do you worry about the wellbeing of your unborn child?	100	66.6	19	12.7	31	20.7
19. Do you want to get vaccinated against COVID-19 while pregnant?	76	50.7	12	8.0	62	41.3
20. Are you planning to breastfeed after obtaining a COVID-19 vaccination	88	58.7	13	8.7	49	32.6

Table (8): demonstrates that 90.0%, 88.7%, 86.7%, 76.7%, 74.0%, 73.3% of the studied pregnant women agreed to obey the strict rules if they were asked to self-quarantine, agreed that COVID-19 affect the economy negatively, agreed that health education about COVID-19 is important, agreed that they should listen to updates on COVID-19 and agreed to trust to staff in the struggle against the outbreak of coronavirus, respctively.

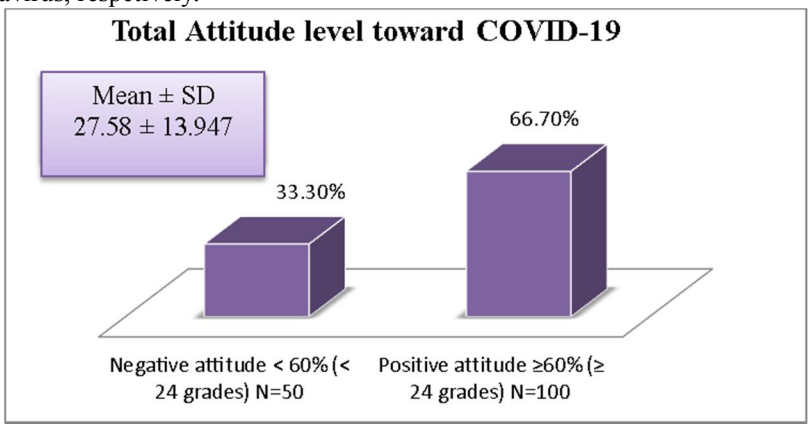


Figure (3): Percentage distribution of the pregnant women regarding their total attitude levels about COVID-19 Pandemic (n= 150).

Figure (3): shows that 66.7% of the studied pregnant women had a positive attitude, toward COVID-19 Pandemic. Mean ± SD score of their attitude was 27.58±13.947.

Table (9): Distribution of the pregnant women according to their Precaution Practices toward COVID-19 Pandemic (n= 150).

Precaution	The pregnant women's responses (n= 150)									
	Never		Rarely		Sometimes		Usually		Always	
	No.	%	No.	%	No.	%	No.	%	No.	%
1. Do you always put on a mask when you leave the house?	14	9.3	12	8.0	20	13.3	55	36.7	49	32.7
2. How frequently do you engage in social isolation in the wake of the pandemic?	5	3.3	9	6.0	66	44.0	29	19.3	41	27.4
3. How frequently do you isolate yourself by staying at home?	7	4.7	12	8.0	36	24.0	34	22.7	61	40.6
4. How frequently do you cover your mouth and nose when you cough or sneeze with your elbow, a cloth, or a tissue?	74	49.3	46	30.7	25	16.7	2	1.3	3	2.0
5. How frequently do you wash or wipe your hands to sanitize them?	9	6.0	5	3.3	24	16.0	41	27.3	71	47.3
6. How often do you disinfect your home?	5	3.3	3	2.0	13	8.7	64	42.7	65	43.3
7. How often do you sanitize your vegetables?	2	1.3	3	2.0	9	6.0	11	7.3	125	83.4
8. How often do you sanitize your fruits?	2	1.3	2	1.3	7	4.7	11	7.3	128	85.4
9. How often do you disinfect your floors?	0	0.0	2	1.3	24	16.0	51	34.0	73	48.7
10. How often do you disinfect your clothes after returning home?	4	2.7	4	2.7	32	21.3	57	38.0	53	35.3
11. How often use the chemical substance for disinfection?	29	19.3	35	23.3	42	28.0	16	10.7	28	18.7
12. How often use alcohol for disinfection?	2	1.3	2	1.3	43	28.7	39	26.0	64	42.7
13. How often do you avoid crowded places and open spaces?	5	3.3	7	4.7	35	23.3	41	27.3	62	41.3

Table (9): demonstrates that 85.4%, 83.4%, 47.3%, 38.0%, 36.7% of the studied pregnant women always wash the fruits, vegetables, and hands using a hand-rub or hand-wash, usually disinfect your clothes after retraining to home, wear a mask every time you leave the house, respectively.

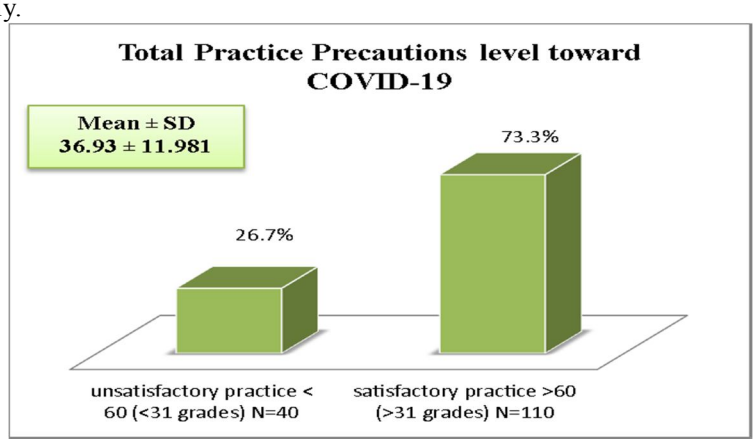


Figure (4): Percentage distribution of the pregnant women regarding their total practice precaution levels toward COVID-19 Pandemic (n= 150).

Figure (4): illustrates that 73.3% of the studied pregnant women had satisfactory precaution practices toward COVID-19. Mean ± SD score of their precaution practices was 36.93 ± 11.981.

Table (10): Relation between demographic data of the pregnant woman and their total knowledge levels toward COVID-19 Pandemic (n= 150).

Demographic data	Total knowledge levels						Test of significance	
	Poor (N= 93)		Average (N = 40)		*Good* (N = 17)		*fisher*	*P*- value
	No.	%	No.	%	No.	%		
Age/ year								
20-30 years (N= 96)	58	60.4	24	25.9	14	14.6	3.055	0.549 NS
31-40 years (N= 43)	28	65.1	13	30.2	2	4.7		
>40 years (N= 11)	7	63.6	3	27.3	1	9.1		
Occupation								
Housewife (N=100)	62	62.0	24	24.0	14	14.0	2.692	0.262 NS
Worker (N=50)	31	62.0	16	32.0	3	6.0		
Education								
Illiterate (N=33)	28	84.8	4	12.1	1	3.0	68.670	0.001**
Read and write (N=25)	20	80.0	3	12.0	2	8.0		
Primary or preparatory (N=27)	4	14.8	20	74.1	3	11.1		
Secondary(N=50)	38	76.0	8	16.0	4	8.0		
University (N=15)	3	20.0	5	33.3	7	46.7		
Economic status								
Low (N=52)	28	53.8	17	32.7	7	13.5	4.372	0358 NS
Moderate (N=95)	64	67.4	22	23.2	9	9.5		
High (N=3)	1	33.3	1	33.3	1	33.4		

Fisher test was used < 5 *statistically significant differences at < 0.05 NS= Not statistically

Table (10): presents that there were no statistically significant differences between the total knowledge and age, occupation and economic status. There were statistically significant differences between the total knowledge and education which *P*-value < 0.001.

Table (11): Relation between demographic data of the pregnant woman and their total attitude levels toward COVID-19 Pandemic (n= 150).

Demographic data	Total attitude levels				Test of significance	
	Negative attitude (N= 50)		Positive attitude (N = 100)			
	No.	%	No.	%	X^2	*P*- value
Age/ year						
20-30 years (N= 96)	26	27.1	70	72.9	5.093	0.783 NS
31-40 years (N= 43)	20	46.5	23	53.5		
>40 years (N= 11)	4	36.4	7	63.6		
Occupation						
Housewife (N=100)	30	30.0	70	70.0	1.500	0.221 NS
Worker (N=50)	20	40.0	30	60.0		
Education						
Illiterate (N=33)	26	78.8	7	21.2	57.982	0.001**
Read and write (N=25)	0	0.0	25	100.0		
Primary or preparatory (N=27)	0	0.0	27	100.0		
Secondary(N=50)	20	40.0	30	60.0		
University (N=15)	4	26.7	11	73.3		
Economic status						
Low (N=52)	26	50.0	26	50.0	10.784	0.001**
Moderate (N=95)	24	25.3	71	74.7		
High (N=3)	0	0.0	3	100.0		

Fisher test was used **statistically significance differences at < 0.01 *statistically significant differences at < 0.05 NS= Not statistically

Table (11): presents that there were no statistically significant differences between the total attitude, age, and occupation but there were statistically significant differences between the total attitude, education and economic status which *P*-value < 0.001.

Table (12): Relation between demographic data of the pregnant woman and their total precaution practices levels toward COVID-19 Pandemic (n= 150).

Demographic data	Total precaution practices levels				Test of significance	
	Satisfactory (N= 110)		Unsatisfactory (N = 40)			
	No.	%	No.	%	X^2	*P*- value
Age/ year						
20-30 years (N= 96)	77	80.2	19	19.8	5.851	0.054*
31-40 years (N= 43)	27	62.7	15	34.9		
>40 years (N= 11)	6	54.5	5	45.5		
Occupation						
Housewife (N=100)	77	77.0	23	23.0	1.403	.236 NS
Worker (N=50)	34	66.0	17	34.0		
Education						
Illiterate (N=33)	11	10.0	22	55.0	40.258	0.001**
Read and write (N=25)	17	15.5	8	20.0		
Primary or preparatory (N=27)	22	20.0	5	12.5		
Secondary(N=50)	46	41.8	4	10.0		
University (N=15)	14	12.7	1	2.5		
Economic status						
Low (N=52)	22	42.3	30	57.7	39.343	0.001**
Moderate (N=95)	85	89.5	10	10.5		
High (N=3)	3	100.0	0	0.0		

Chi test was used between qualitative variable **statistically significance differences at < 0.01 NS= Not statistically

Table (12): presents that there were no statistically significant differences between the total precaution practices levels and occupation but there were statistically significant differences between the total precaution practices levels, age, and education and economic status which *P*-value < 0.001.

Table (13): Correlation between knowledge, Attitude, and practices toward COVID-19 pandemic of the pregnant woman

		Total Knowledge	TOTAL Attitude	Total Practice
Total Knowledge	**R**	1	0.505**	0.431**
	P-value		<0.001	<0.001
Total Attitude	**R**	0.505**	1	0.853**
	P – value	<0.001		<0.001
Total Practice	**R**	0.431	0.853**	1
	P – value	<0.001	<0.001	

Pearson correlation test was used **. Correlation is significant at the 0.01 level.

Table (13): shows a positive correlation between the total knowledge toward COVID- 19 and attitude and precautions practice of the studied pregnant women with differences that were statistically significant with a p value of.001.

Discussion

Pregnant women are more vulnerable to illness since pregnancy compromises their immune systems **(Han et al., 2021).** Numerous pregnant women throughout the world are experiencing stress and anxiety as a result of this rapid COVID19 pandemic. The absence of proper information on pregnancy with COVID-19 crisis as well as associated sequelae is the primary lead to this anxiety as well as fear. Additionally, there are worries about how COVID-19 infection may affect fetal, neonatal, and pregnancy results all throughout the global **(Michael, 2022).**

The intent as well as essence of the present research is to assess pregnant women's performance toward the COVID-19 pandemic.

Regarding age of the pregnant women, less than sixty- six percent of the them age was from 20 to 30 yrs., with Mean ± SD 29.5 ± 6.5 yrs., this was in close proximity to the research of **Lei et al. (2020)** that stated a mean age among the participant group 30.4 ± 3.61 yrs. While at odds with the research of **Schwartz & Graham, (2020)** who reported the mean age of the pregnant England women was 24.68 ± 4.37 yrs. This is due to this age is the most common age of pregnancy.

The actual research also denoted that < two third of the participants' occupation was housewife. This is agreed with **Vousden et al. (2021)** who concluded that less than sixty-six percent of the participants sample was housewife. This is because a list of several major obstacles that women face, including being faced with a disproportionate amount of childcare and household duties that are hard to balance with working hours and poor working conditions in the expanding informal private sector.

According to **Allotey et al. (2020),** who found that approximately fifty-percent of the sample had (university education), only thirty-three percent of the participants had secondary education. **Magala et al. (2021),** who mentioned that a large portion of the participants had high education, also disagreed with these findings. This may be due to the fact that a large section of the study group was from a moderate economic background and that they preferred to wait until they had completed high school due to rising education prices.

In terms of household size, less than sixty-six percent of the participants was narrow, which contradicted the outcome of a research by **Gale et al. (2021)** who found that nearly fifty-percent of the participants were wide household size. Also, it opposite with **Vasilevski et al. (2021)** they illustrated that the high proportion of the participants had a wide household size. This might be due to the fact that over half of the participants were nulliparous and childless.

This research discovered that more than fifty-percent of the participants had multigravida. This disagreed with the research by **Shimabukuro et al. (2021)** who summarized that less than one thirds of the women were multigravida. So this may be due to early marriage which is deeply rooted with Egyptians traditions and also lack of education.

Additionally, the current investigation revealed that more than fifty percent of the sample was nullipara. This is due to lower half of the participants had primigravida as well as the women who pregnancy may occur abortion before the delivery. This is agreed with **Knight et al. (2020)** who concluded that higher than fifty-percent of the women was nullipara. An individual may choose to be nulliparous by using contraception or abstains. Other women may have a history of pregnancy but haven't given a live birth due to miscarriages or abortions and stillbirths, already a quarter of the participants were aborted before.

In terms of type of current conception, majority of the women were naturally conceived, which contradicted the outcome of a research by **Collier et al. (2021)** who found that more than fifty percent of the participants were naturally conceived also agreed with **Juusela et al. (2021),** who approved that the high proportion of the participants had naturally conceived. This may be due to the fact that over two thirds of the sample was young adults under the age of thirty and that fertility increases in this age.

The actual research also denoted that more than fifty percent of the sample hadn't children. This is agreed with **Mascio et al. (2020)** who came to the conclusion that more than fifty percent of the sample under study didn't have children. The primary causes of this may be due to rising costs of having children, employment insecurity, and housing issues.

The actual research found that approximately two-fifths of pregnant women's information sources on the COVID-19 crisis were on the internet as well as that TV/radio accounted for more than half of their sources of information. This may be a result of the pandemic's isolation period, which forced most people including expectant mothers to stay current on news and information via radio or television. Additionally, the popularity of social networking websites and applications increased women's reliance on the internet to keep up with pandemic news. This result is consistent with that of **Honarvar et al. (2020),** who discovered that most sample chose to observe the news in the national media.

More than two thirds of the participants said that they knew the definition of COVID-19, which corresponded to the findings of **Baergen & Heller's study from 2020,** who also found that the same percentage of participants believed that COVID-19 is a real. This was Contradictory to the research done by **Diamanti et al. (2020)** who claimed that fifty percent of the investigated group was denied the existence of COVID-19.

More than two thirds of the sample in the current investigation concurred that COVID-19 was caused by viral infection. This may be because of the information introduced by the social media about the COVID-19 pandemic. This is in line with the outcomes of **Liao et al. (2020),** They stated that more than two thirds of the study population knew COVID-19 was brought on by viral infection. The COVID-19 is mostly due to the extremely contagious (SARS-CoV-2)severe acute respiratory syndrome coronavirus 2. Recently know coronavirus SARS-CoV-2 is the reason of the viral illness mean as coronavirus disease (COVID-19). A broad family of viruses known as coroviruses can infect both people and animals..

Regarding mode of transmission, more than two third of the samples' said that COVID-19 crisis can be transmitted by eyes touch, nose, and mouth after close with an infected individual when they cough or sneeze or contaminated surfaces, This may be because of the personnel began to listen more information about COVID-19 pandemic to avoid the method of transmission to fear from the disease .

This was in contact with research regarding **Million et al., (2020)** who found that the same result. Also came in closely with the research of **Lamouroux et al. (2020)** who found that COVID-19 infection can be spread by touching the eyes, nose, and mouth post coming into contact with an infected individual who is coughing or sneezing or contaminated surfaces, according to research that indicated that half of the sample under study believed this to be true. The virus admit the body through coming into touch with the mucosa of the eyes, nose, and mouth, which is why this is the case. The virus can be spread by touching a contaminated surface and then touching the eyes, nose, or mouth, or by inhaling droplets from an infected person.

Less than quarter of the participants in the current study agreed that COVID19 is transmitted from animal to human. This contradicts the findings of **Peng et al. (2020),** who came to the conclusion that more than fifty-percent of the tested sample was aware that COVID-19 is a transmission from animal to human. The main cause for this is that, despite the fact that the infection is highly contagious among people, the latest research on human-to-human transmission reveals that animals do not play a substantial part in the infection's spread. To fully comprehend how COVID-19 affects animals and the potential for human-animal transmission, more research is nevertheless required.

Regarding risk factors groups, less than quarter of the participants' reported that every person has the same dangerous of infection from COVID-19, this was exposed to the research of **Alzamora et al., (2020)** who found the same result. While contradicted with the study of **Tefera et al. (2020)** who said that fifty percent of the participants concluded that every person has the same dangerous of infection with COVID-19. This may be the result of various educational backgrounds of the samples.

The actual research also denoted that more than sixty six percent of the sample didn't know that COVID-19 patients without symptoms can transmit infection. This is disagreed with **Quinney et al. (2020)** who concluded that more than fifty percent of the studied sample was known that COVID-19 patients without symptoms can transmit infection. This variation might be related to research on various participants' educational backgrounds.

Regarding protective measures, management and vaccination, more than quarter of the participants' said that wearing 2 masks can limit infection from COVID-19 more than 1 layer, this was exposed to the research of **Nooney et al., (2021) and Trønnes et al. (2022)** who were found that the same result.

The actual research also denoted that less than two third of the sample knew that the optimal distance between two individuals should be 6 feet during social distance. This is agreed with **Tuan et al. (2023)** who concluded the same results.

Regarding treatment of COVID-19 more than quarter of the participants' reported that no effective treatment for COVID-19 is available currently, but symptomatic as well as supportive cure can assist most ill person recover from the infection, this was exposed to the research of **Kreuzberger et al., (2021)** who found the same result. While contradicted with the research of **Gupta et al. (2022)** who discovered that more than a third of the investigated sample came to the conclusion that there is presently no effective management for COVID-19, but that symptomatic as well as supportive care can assist the majority of patients treated from the illness. This is because immunomodulatory drugs that have already received approval, such as glucocorticoids like dexamethasone, as well as cytokine antagonists like tocilizumab, as well as Janus kinase inhibitors like baricitinib, may be beneficial for hospitalized ill person with severe or critical COVID-19.

The actual research also denoted that near quarter of the sample knew that there was no data on the efficacy as well as safety of vaccinations to treat COVID-19. This is agreed with **Yoshida et al. (2022)** they discovered that more than one-third of the investigated sample had no knowledge of the COVID-19 vaccine's safety as well as efficacy. This may be because of no effective treatment about COVID-19 pandemic until this time.

Less than quarter of the sample in the actual research was informed that the COVID-19 vaccine can avoid severe symptoms, according to the study. This may be because of vaccine bout COVID-19 pandemic suppresses the symptoms COVID-19 pandemic . This is in agreement with **Frallonardo et al. (2023),** who came to the conclusion that less than quarter of the sample under study was aware that COVID-19 vaccination avoids severe symptoms. The fundamental justification for this is that coronavirus vaccination lowers the likelihood of developing a serious disease or passing away from coronavirus. Two weeks after taking the vaccine, protection often begins. No vaccine is one hundred percent effective, although symptoms are likely to be less severe. This is true of all medications.

Regarding knowledge related to antenatal, labor and postnatal period, nearly less than two third of the participants stated that they didn't know if the pregnant woman at higher dangerous of getting severe respiratory disease compared to a non-pregnant woman, this was exposed to the research of **Aggarwal et al., (2022)** who found the same result. While contradicted with the study of **Gonzalez-Bocco et al. (2023)** who stated high quarter of the study's sample was unsure as to whether pregnant women were more likely than non-pregnant women to get serious respiratory illnesses. This can be because the participants are uneducated.

The actual research also presented that more than sixty-six percent of the sample didn't know that pregnancy with COVID-19 infection is more at risk of poor pregnancy outcomes in their 3rd trimester. This may be because of high number of the participants were housewife . This is agreed with **Manciulli et al. (2022)** who concluded that nearly more than two third of the studied sample didn't know that pregnancy with COVID-19 infection is more at cause of poor pregnancy outcomes in their third trimester. The primary cause of COVID-19 in pregnancy might raise the risk of premature delivery (born before 37 weeks of pregnancy), higher likelihood of stillbirth, preeclampsia (dangerously high blood pressure), blood clots, and the requirement for an emergency C-section.

Additionally, the actual research revealed that more than sixty-six percent of the sample was ignorant that breastfeeding is safe for COVID-19 patients with mild condition. This can be because the high number of participants are uneducated or low level of education. This is in line with the findings of **Cicchitto et al. (2022),** who came to the conclusion that almost sixty-six percent of the sample under investigation were unaware that breastfeeding is safe for COVID-19 patients with mild condition. The adoption of safeguards like hand washing and masks, combined with the fact that breastfeeding still has advantages over formula

feeding, is the primary factor. In the case of mothers with COVID-19, both direct breastfeeding and giving expressed breast milk seem to be safe procedures. Breast milk from mothers who have COVID-19 may contain antibodies and other components that can protect neonates.

The actual research also showed that nearly less than two third of the sample had poor total knowledge score regarding COVID-19 Pandemic with Mean ± SD of their knowledge was 18.48 ± 10.057. This is agreed with **Evans et al. (2023)** who concluded that nearly less than more than sixty-six percent of the studied sample had poor total knowledge about COVID-19 Pandemic with Mean ± SD score of their knowledge was 21.48 ± 17.057. This can be because the high number of participants had low level of education as well as low or moderate income.

Regarding attitude toward COVID-19 pandemic, less than two third of the participants agreed that they should keep a space during social distancing, this came into contact with the study of **Zaqout et al., (2022)** who found the same result. Also came in contact with the study of **Villanego et al. (2022)** who found that more than sixty-six percent of the studied sample agreed that they should keep a space during social distancing. This is because everyone can be protected, especially the most vulnerable members of society, when keep a distance from one another. It is critical to understand that the danger of transmission is higher with close intimate contact.

The actual research also showed that more than two third of the sample agreed with taken adequate precautions about the coronavirus outbreak. This is agreed with **Aleem et al. (2023)** who concluded that nearly more than two third of the studied sample agreed with taken adequate precautions about the coronavirus outbreak. This might be because people have been given a lot of advice on how to prevent the spread of COVID-19, such as to cover their mouth and nose when they cough or sneeze with a tissue, discard the tissue, and immediately wash their hands. If feasible, use a bathroom alone and wash your hands with soap and water for at least 20 seconds. You can also use an alcohol-based hand sanitizer.

The current study also showed that about half of the sample agreed to be vaccinated against COVID-19 during pregnancy. This can be because the participants thinking that vaccinated may protect them from severe illness. This is agreed with **Lobasso et al. (2023)** who concluded the same results. The main reason for this pregnant woman has a higher risk of more severe illness from coronavirus (COVID-19) than nonpregnant women. Getting vaccinated may protect them from severe illness. Vaccination also may help protect fetus.

The current study also revealed that, with a mean and standard deviation of 27.58 and 13.947, the sample's attitude toward the COVID-19 pandemic was favorable in more than two thirds of cases. This can be because the participants agree for keep a space during social distancing; taking vitamins to control covid-19 is suitable; and taken all necessary precautions to avoid contracting the coronavirus. This is in line with the findings of **De Vito et al. (2022),** who came to the conclusion that roughly two thirds of the investigated sample had a favorable attitude toward the COVID19 Pandemic with a mean standard deviation score of 25.3512. 991.

Nearly one-third of the individuals always wore a mask whenever they left the house as a precaution against the COVID-19 pandemic; this result was consistent with that of **Mambelli et al. (2023),** which also found the same thing. This can be as a result of numerous recommendations on disease prevention.

The actual research also showed that more than one thirty- three percent of the sample had disinfected their clothes after returning home. This is agreed with **Martin-Blondel et al. (2022)** who concluded that nearly more than one third of the participants disinfects clothes after returning home. This is because contaminated clothes can transmit COVID-19 infection and regular washing of these clothes helps to destroy it.

The actual research also showed that less than half of the sample had use alcohol for disinfection. This can be because the participants thinking that alcohol protect them from infection. This is disagreed with **Palomino-Cabrera et al. (2023)** who came to the conclusion that roughly two thirds of the sample under study used alcohol as a disinfectant. The key factors influencing these alcohols' effectiveness are the type of virus and their concentration. Non-enveloped viruses are those that lack a lipid membrane, whereas enveloped viruses have a lipid membrane. Non-enveloped viruses typically exhibit greater resistance to disinfectants.

The actual research also showed that more than two third of the sample had satisfactory precaution practices toward COVID-19 with Mean ± SD score of their precaution practices was 36.93 ± 11.981. This can be because the participants always put on a mask when you leave the house; frequently do you isolate yourself by staying at home; and frequently do you wash or wipe your hands to sanitize them. This is agreed with **Saheb Sharif-Askari et al. (2022)** who concluded that nearly more than two third of the studied sample had satisfactory precaution practices toward COVID-19; Mean ± SD score of their knowledge was 33.88 ± 10.787. The primary reason for these individuals to properly practice preventative behaviors, such as maintaining good personal hygiene, donning a face mask, and avoiding close contact with others, is to drastically reduce the transmission of COVID-19.

It was found that there were statistically significant variations between total knowledge and education in the relationship between the demographic information of the pregnant woman and their total knowledge score regarding the COVID-19 Pandemic. This is seen as a natural connection because highly educated women have the chance to do more research to learn more about the pandemic.

Concerning relation between demographic data of the pregnant woman and their total attitude levels toward COVID-19 pandemic there were statistically significant differences between the total attitude, education and economic status. This came in accordance with **Blakeway et al., (2022),** who found that statistically significant, differences between the total attitude, education and economic status. They also agreed with **Piccicacco et al., (2022)** who conclude the same results.

Regarding relation between demographic data of the pregnant woman and their total precaution practices levels toward COVID-19 Pandemic there were statistically significant differences between the total precaution practices levels, and age, education and economic status. This came in accordance with **Adachi et al., (2022),** who found that statistically significant differences between the total precaution practices levels, age, and education and economic status. They also agreed with **Gliga et al., (2023),** who reported the same results.

In terms of the correlation between knowledge, Attitude, and practices toward COVID-19 pandemic of the pregnant woman, it was discovered that there were a positive correlation between the total knowledge toward COVID- 19 and attitude and precaution practices of the studied pregnant women with statistically significant differences. This came in accordance with **Limaye et al., (2021),** who reported that there was a positive correlation between the total knowledge toward COVID- 19 and attitude and precaution practices of the studied pregnant women with statistically significant differences. They also agreed with **Yefet et al., (2023).** This can be rationalized that knowledge, attitudes, and practices (KAP) toward COVID-19 are influenced by each other and so it is important for controlling and preventing this serious pandemic are to increase the knowledge and improve attitudes, and precaution practices.

Conclusion:

The study concluded that near two third of the studied pregnant women had poor knowledge, about two third had a positive attitude, about three quarter had satisfactory precaution practices regarding COVID-19 Pandemic. There was a positive correlation between the total KAP of the studied pregnant women with statistically significant differences. Also, this study concluded that the KAP survey offer an appropriate framework for assessing current initiatives and identifying successful social behavior change strategies.

Recommendation

The following recommendations are made based on the current study's findings.

- Conducting a study on another geographical area and apply an educational program to determine the effect of it on pregnant women KAP toward COVID-19.
- Raising policymakers', program designers', and stakeholders' awareness of COVID19 infection prevention strategies among pregnant women.
- Take proactive steps for this vulnerable subpopulation by health authorities
- Increase government and other policymakers' efforts to educate and counsel pregnant women about their health, including the distribution, transmission, and preventative measures for the fatal COVID-19 virus.
- Extended electronic media to access for the limited in rural areas, media campaigns.
- Ensure dissemination of accurate information by government about taking the COVID-19 vaccine during pregnancy
- Encourage the continuation of COVID-19 health education programs and community empowerment initiatives, especially for expectant mothers.
- Conduct this research on the different area and large number of the participants to generalized the result

References

1. Adachi E, Saito M, Koga M, Tsutsumi T, Yotsuyanagi H (2022). Favorable Outcome Following Sotrovimab Monoclonal Antibody in a Patient with Prolonged SARS-CoV-2 Omicron Infection with Covid 19. Intern Med. 2022 Nov 15;61(22):3459-3462. doi: 10.2169/internalmedicine.0485-22. Epub 2022 Sep 6. PMID: 36070950
2. Africa news, (2020). COVID 19: Egypt confirm first case in Africa available @ https://www.africanews.com/2020/02/14/covid-19-egypt-confirms-first-coronavirus-case-in-africa/
3. Aggarwal NR, Beaty LE, Bennett TD, Carlson NE, Davis CB, Kwan BM, Mayer DA, Ong TC, Russell S, Steele J, Wogu AF, Wynia MK, Zane RD, Ginde AA (2022). Real-World Evidence of the Neutralizing Monoclonal Antibody Sotrovimab for Preventing Hospitalization and Mortality in COVID-19 Outpatients. J Infect Dis. 2022 Dec 13;226(12):2129-2136. doi: 10.1093/infdis/jiac206. PMID: 35576581
4. Aleem A, Olarewaju O, Pozun A (2023). Evaluating and Referring Patients for Outpatient Monoclonal Antibody Therapy for Coronavirus (COVID-19) In the Emergency Department. 2023 Jan 25. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2023 Jan–. PMID: 34662075
5. Allotey J, Stallings E, Bonet M, (2020). Clinical manifestations, risk -factors, and maternal and perinatal outcomes of coronavirus disease 2019 in pregnancy: living systematic review and meta-analysis of South-Western Kiribati. BMJ 2020;370:m3320.
6. Alzamora, M. C., Paredes, T., Caceres, D., Webb, C. M., Valdez, L. M., & La Rosa, M. (2020). Severe COVID-19 during pregnancy and possible vertical transmission. American journal of perinatology, 37(08), 861- 865.
7. Anikwe, C. C., Ogah, C. O., Anikwe, I. H., Okorochukwu, B. C., & Ikeoha, C. C. (2020). Coronavirus disease 2019: Knowledge, attitude, and practice of pregnant women in a tertiary hospital in Abakaliki, southeast Nigeria. International Journal of Gynecology & Obstetrics, 151(2), 197-202.
8. Baergen, R. N., & Heller, D. S. (2020). Placental pathology in Covid-19 positive mothers: preliminary findings. Pediatric and Developmental Pathology, 23(3), 177-180.
9. Bahakel, H., Murphy, C., Frenck Jr, R. W., Grimley, M. S., Marsh, R. A., Paulsen, G. C., ... & Danziger-Isakov, L. (2022). Single site experience of the use of monoclonal antibodies for the treatment of COVID-19 in high-risk pediatric and young adult patients. The Pediatric Infectious Disease Journal, 41(12), 985.
10. Besho, M., Tsegaye, R., Yilma, M. T., Kasaye, H. K., Tolossa, T., Hiko, N., ... & Wakuma, B. (2021). Knowledge, attitude and practice toward corona virus infection among pregnant women attending antenatal care at public hospitals in three wollega zones, ethiopia. International Journal of General Medicine, 3563-3573.
11. Blakeway H, Amin-Chowdhury Z, Prasad S, Kalafat E, Ismail M, Abdallah FN, Rezvani A, Amirthalingam G, Brown K, Le Doare K, Heath PT, Ladhani SN, Khalil A (2022). Evaluation of immunogenicity and reactogenicity of COVID-19 vaccines in pregnant women. Ultrasound Obstet Gynecol. 2022 Nov;60(5):673-680. doi: 10.1002/uog.26050. PMID: 36318630
12. Cicchitto G, Cardillo L, Sequino D, Sabatini P, Adamo L, Marchitiello R, Viscardi M, Cozzolino L, Cavallera A, Bocchino M, Sanduzzi Zamparelli A, Ferrigno F, de Carlo E, de Martinis C, Fusco G (2022). Effectiveness of Sotrovimab in the Omicron Storm Time: A Case Series. Viruses. 2022 Dec 30;15(1):102. doi: 10.3390/v15010102. PMID: 36680143
13. Collier AY, McMahan K, Yu J, (2021). Immunogenicity of COVID-19 mRNA vaccines in pregnant and lactating women. JAMA 2021; 325:2370–80.
14. Degu, A., Nibret, G., Gebrehana, H., Getie, A., & Getnet, B. (2021). Knowledge and attitude towards the current pandemic corona virus disease and associated factors among pregnant women attending antenatal care in debre tabor general hospital northwest ethiopia: An institutional-based cross-sectional study. International Journal of Women's Health, 61-71.
15. De Vito A, Colpani A, Saderi L, Puci M, Zauli B, Fiore V, Fois M, Meloni MC, Bitti A, Di Castri C, Maida I, Babudieri S, Sotgiu G, Madeddu G (2022). Impact of Early SARS-CoV-2 Antiviral Therapy on Disease Progression. Viruses. 2022 Dec 27;15(1):71. doi: 10.3390/v15010071. PMID: 36680111
16. Diamanti A. P., M. M. Rosado, C. Pioli, G. Sesti, and B. Laganà, "Cytokine release syndrome in COVID-19 patients, a new scenario for an old concern: the fragile balance between infections and autoimmunity," International Journal of Molecular Sciences, vol. 21, no. 9, p. 3330, 2020.
17. Evans A, Qi C, Adebayo JO, Underwood J, Coulson J, Bailey R, Lyons R, Edwards A, Cooper A, John G, Akbari A (2023). Real-world effectiveness of molnupiravir, nirmatrelvir-ritonavir, and sotrovimab on preventing hospital admission among higher-risk patients with COVID-19 in Wales: A retrospective cohort study. J Infect. 2023 Apr;86(4):352-360. doi: 10.1016/j.jinf.2023.02.012. Epub 2023 Feb 10. PMID: 36773891
18. Frallonardo L, Vimercati A, Novara R, Lepera C, Ferrante I, Chiarello G, Cicinelli R, Mongelli M, Brindicci G, Segala FV, Santoro CR, Bavaro DF, Laforgia N, Cicinelli E, Saracino A, Di Gennaro F (2023). Use of Sotrovimab in a cohort of pregnant women with a high risk of COVID 19 progression: a single-center

experience. Pathog Glob Health. 2023 Jul;117(5):513-519. doi: 10.1080/20477724.2023.2188839. Epub 2023 Mar 10. PMID: 36896940

19. Gale C, Quigley MA, Placzek A, (2021). Characteristics and outcomes of neonatal SARS-CoV-2 infection in the UK: a prospective national cohort study using active surveillance. Lancet Child Adolescent Health 2021; 5:113–21.
20. Geldsetzer, P. (2020). Use of rapid online surveys to assess people's perceptions during infectious disease outbreaks: a cross-sectional survey on COVID-19. Journal of medical Internet research, 22(4), e18790.
21. Gliga S, Lübke N, Killer A, Gruell H, Walker A, Dilthey AT, Thielen A, Lohr C, Flaßhove C, Krieg S, Pereira JV, Seraphin TP, Zaufel A, Däumer M, Orth HM, Feldt T, Bode JG, Klein F, Timm J, Luedde T, Jensen BO (2023). Rapid Selection of Sotrovimab Escape Variants in Severe Acute Respiratory Syndrome Coronavirus 2 Omicron-Infected Immunocompromised Pregnancy. Clin Infect Dis. 2023 Feb 8;76(3):408-415. doi: 10.1093/cid/ciac802. PMID: 36189631
22. Gonzalez-Bocco IH, Beluch K, Cho A, Lahoud C, Reyes FA, Moshovitis DG, Unger-Mochrie GM, Wang W, Hammond SP, Manne-Goehler J, Koo S (2023). Safety and tolerability study of sotrovimab (VIR-7831) prophylaxis against COVID-19 infection in immunocompromised individuals with impaired SARS-CoV-2 humoral immunity. Pilot Feasibility Study. 2023 Jun 16;9(1):100. doi: 10.1186/s40814-023-01325-y. PMID: 37328890
23. Gupta A, Gonzalez-Rojas Y, Juarez E, Crespo Casal M, Moya J, Rodrigues Falci D, Sarkis E, Solis J, Zheng H, Scott N, Cathcart AL, Parra S, Sager JE, Austin D, Peppercorn A, Alexander E, Yeh WW, Brinson C, Aldinger M, Shapiro AE; COMET-ICE Investigators (2022). Effect of Sotrovimab on Hospitalization or Death Among High-risk Patients with Mild to Moderate COVID-19: A Randomized Clinical Trial. JAMA. 2022 Apr 5;327(13):1236-1246. doi: 10.1001/jama.2022.2832. PMID: 35285853
24. Han C., Li M., Haihambo N. (2021). Mechanisms of recurrent outbreak of COVID-19: a model-based study. Nonlinear Dyn (2021). https://doi.org/10.1007/s11071-021-06371-w PMID: 33758464
25. Honarvar Behnam, Kamran B. Lankarani, Ali Kharmandar, Fatemeh Shaygani, Mohammadhassan Zahedroozgar, Mohammad Reza Rahmanian Haghighi, Sulmaz Ghahramani, Hossein Honarvar, Mohammad Mehdi Daryabadi, Zahra Salavati, Seyed Mohammad Hashemi, Hassan Joulaei & Marziyeh Zare (2020). Knowledge, attitudes, risk perceptions, and practices of adults toward COVID-19: a population and field-based study from Iran. International Journal of Public Health volume 65, pages731–739.
26. Juusela A., Nazir M., and Gimovsky M., (2020). "Two cases of coronavirus 2019-related cardiomyopathy in pregnancy in Indonesia," American journal of obstetrics and gynecology, vol. 2, no. 2, p. 100113, 2020.
27. Knight, M., Bunch, K., Vousden, N., Morris, E., Simpson, N., Gale, C., ... & Kurinczuk, J. J. (2020). Characteristics and outcomes of pregnant women admitted to hospital with confirmed SARS-CoV-2 infection in UK: national population-based cohort study. bmj, 369.
28. Kreuzberger N, Hirsch C, Chai KL, Tomlinson E, Khosravi Z, Popp M, Neidhardt M, Piechotta V, Salomon S, Valk SJ, Monsef I, Schmaderer C, Wood EM, So-Osman C, Roberts DJ, McQuilten Z, Estcourt LJ, Skoetz N (2021). SARS-CoV-2-neutralising monoclonal antibodies for treatment of COVID-19. Cochrane Database Syst Rev. 2021 Sep 2;9(9):CD013825. doi: 10.1002/14651858.CD013825.pub2. PMID: 34473343
29. Lamouroux A., T. Attie-Bitach, J. Martinovic, M. Leruez-Ville, and Y. Ville (2020), "Evidence for and against vertical transmission for severe acute respiratory syndrome coronavirus 2," American Journal of Obstetrics and Gynecology, vol. 223, no. 1, pp. 91.e1–91. e4, 2020.
30. Lee, R. W. K., Loy, S. L., Yang, L., Chan, J. K. Y., & Tan, L. K. (2020). Attitudes and precaution practices towards COVID-19 among pregnant women in Singapore: a cross-sectional survey. BMC pregnancy and childbirth, 20, 1-10.
31. Lei D, Wang C, Li C, Fang C, Yang W, Cheng B (2020). Clinical characteristics of pregnancy with the 2019 novel coronavirus disease (COVID-19) infection. Chin J Perinat Med 2020; 23 (3).
32. Liao J., X. He, Q. Gong, L. Yang, C. Zhou, and J. Li (2020), "Analysis of vaginal delivery outcomes among pregnant women in Wuhan, China during the COVID-19 pandemic," International Journal of Gynecology & Obstetrics, vol. 150, no. 1, pp. 53–57, 2020.
33. Limaye MA, Roman AS, Trostle ME, Venkatesh P, Lantigua Martinez M, Brubaker SG, Chervenak J, Wei LS, Sahani P, Grossman TB, Meyer JA, Penfield CA (2021). Predictors of severe and critical disease in pregnant women with SARS-CoV-2. J Matern Fetal Neonatal Med. 2022 Dec;35(25):7536-7540. doi: 10.1080/14767058.2021.1951216. Epub 2021 Sep 1. PMID: 34470122
34. Lobasso A, di Gennaro C, Poggiano MR, Vasta A, Ranucci RAN, Lobianco R, Tucci AG, Cavaglià E, Di Micco P (2023). Ischemic Stroke Occurring in a Patient Treated with Monoclonal Antibodies for COVID-19. Viruses. 2023 May 25;15(6):1235. doi: 10.3390/v15061235. PMID: 37376535
35. M. Million, J.-C. Lagier, P. Gautret (2020)., "Early treatment of COVID-19 patients with hydroxychloroquine and azithromycin: A retrospective analysis of 1061 cases in Marseille, France," Travel medicine and infectious disease, vol. 35, p. 101738, 2020.
36. Maat of Peace, Development, and Human Rights. (2020). Protecting human rights during and after covid-19 available @ https://www.maatpeace.org/en/
37. Magala Ssekandi A, Sserwanja Q, Olal E, (2021). Corticosteroids use in pregnant women with COVID-19: recommendations from available evidence. J Multidiscipline Health c 2021; 14:659–63.
38. Mambelli E, Gasperoni L, Maldini L, Biagetti C, Rigotti A (2023). Sotrovimab in SARS-COV-2 chronic hemodialysis patients in the Omicron era. Is intradialytic administration feasible? Report of 4 cases. J Nephrol. 2023 Apr;36(3):669-672. doi: 10.1007/s40620-022-01449-z. Epub 2022 Sep 13. PMID: 36098880
39. Manciulli T, Modi G, Campolmi I, Borchi B, Trotta M, Spinicci M, Lagi F, Bartoloni A, Zammarchi L (2022). Treatment with anti-SARS-CoV-2 monoclonal antibodies in pregnant and postpartum women: first experiences in Florence, Italy. Infection. 2022 Oct;50(5):1139-1145. doi: 10.1007/s15010-022-01777-z. Epub 2022 Mar 7. PMID: 35257291
40. Martin-Blondel G, Marcelin AG, Soulié C, Kaisaridi S, Lusivika-Nzinga C, Zafilaza K, Dorival C, Nailler L, Boston A, Ronchetti AM, Melenotte C, Cabié A, Choquet C, Trinh-Duc A, Lacombe K, Gaube G, Coustillères F, Pourcher V, Martellosio JP, Peiffer-Smadja N, Chauveau M, Housset P, Piroth L, Devaux M, Pialoux G, Martin A, Dubee V, Frey J, Le Bot A, Cazanave C, Petua P, Liblau R, Carrat F, Yordanov Y (2022). Time to negative PCR conversion amongst high-risk patients with mild-to-moderate Omicron BA.1 and BA.2 COVID-19 treated with sotrovimab or nirmatrelvir. Clin Microbiol Infect. 2023 Apr;29(4): 543.e5-543.e9. doi: 10.1016/j.cmi.2022.12.016. Epub 2022 Dec 28. PMID: 36586513
41. Mascio D. D., A. Khalil, G. Saccone (2020)., "Outcome of coronavirus spectrum infections (SARS, MERS, COVID-19) during pregnancy: a systematic review and meta-analysis," American journal of obstetrics and gynecology, vol. 2, no. 2, p. 100107, 2020.
42. Michael Marshall (2023). Does covid-19 affect pregnancies? New Sci. 2023 Jun 3; 258(3441): 14–15. Published online 2023 Jun 2. Doi: 10.1016/S0262 4079(23)00987-9 PMCID: PMC10238109. PMID: 37292183.
43. Musa, S. S., Zhao, S., Wang, M. H., Habib, A. G., Mustapha, U. T., & He, D. (2020). Estimation of exponential growth rate and basic reproduction number of the coronavirus disease 2019 (COVID-19) in Africa. Infectious diseases of poverty, 9(1), 1-6.
44. Mustafa, M. W. M. (2020). Audiological profile of asymptomatic Covid-19 PCR-positive cases. American Journal of Otolaryngology, 41(3), 102483.
45. Nissen, L. (2020). Social work and the future in a post-Covid 19 world: A foresight lens and a call to action for the profession. Journal of Technology in Human Services, 38(4), 309-330.
46. Nooney J, Thor S, de Vries C, Clements J, Sahin L, Hua W, (2021). Assuring Access to Safe Medicines in Pregnancy and Breastfeeding. Clin Pharmacol Ther. 2021; 110(4):941–945. 10.1002/cpt.2212. - PMC - PubMed
47. Palomino-Cabrera R, Tejerina F, Molero-Salinas A, Ferris M, Veintimilla C, Catalán P, Rodríguez Macias G, Alonso R, Muñoz P, García de Viedma D, Pérez-Lago L; Gregorio Marañón Microbiology-ID COVID 19 Study Group (2023). Frequent Emergence of Resistance Mutations Following Complex Intra-Host Genomic Dynamics in SARS-CoV-2 Patients Receiving Sotrovimab. Antimicrob Agents Chemother. 2023 Jul 18;67(7): e0026623. doi: 10.1128/aac.00266-23. Epub 2023 Jun 6. PMID: 37278655
48. Peng Z., J. Wang, Y. Mo (2020)., "Unlikely SARS-CoV-2 vertical transmission from mother to child: a case report," Journal of Infection and Public Health, vol. 13, no. 5, pp. 818–820, 2020.

49. Phillips, J., & Catrambone, C. (2020). Nurses are playing a crucial role in this pandemic—as always. Scientific American. https://blogs. scientificamerican. com/observations/nurses-are-playing-a-crucial-role-in-this-pandemic-mdash-as-always.
50. Piccicacco N, Zeitler K, Ing A, Montero J, Faughn J, Silbert S, Kim K (2022). Real-world effectiveness of early remdesivir and sotrovimab in the highest-risk COVID-19 outpatients during the Omicron surge. J Antimicrob Chemother. 2022 Sep 30;77(10):2693-2700. doi: 10.1093/jac/dkac256. PMID: 35913836
51. Quinney, S.K., Bonate, P.L (2020). A pharmacometrician's role in enhancing medication use in pregnancy and lactation. J Pharmacokinet Pharmacodyn. 2020;47;267–269. 10.1007/s10928-020-09707-y - PMC - PubMed
52. Radwan, G. N. (2020). Epidemiology of SARS-CoV-2 in Egypt. Eastern Mediterranean Health Journal, 26(7), 768-773.
53. Rasmussen, S. A., Kelley, C. F., Horton, J. P., & Jamieson, D. J. (2021). Coronavirus disease 2019 (COVID-19) vaccines and pregnancy: what obstetricians need to know. Obstetrics and gynecology, 137(3), 408.
54. Robert, P. and Beschel, J.R (2021). Policy and Institutional Responses to COVID-19 in the Middle East and North Africa: Egypt available @ https://www.brookings.edu/research/policy-and-institutional-responses-to-covid-19-in-the-middle-east-and-north-africa-egypt/
55. Saheb Sharif-Askari F, Ali Hussain Alsayed H, Tleyjeh I, Saheb Sharif-Askari N, Al Sayed Hussain A, Saddik B, Hamid Q, Halwani R (2022). Sotrovimab Lowers the Risk of COVID-19 Related Hospitalization or Death in a Large Population Cohort in the United Arab Emirates. Clin Pharmacol Ther. 2022 Dec;112(6):1214-1223. doi: 10.1002/cpt.2700. Epub 2022 Jul 22. PMID: 35780295
56. Schwartz, D. A., & Graham, A. L. (2020). Potential maternal and infant outcomes from (Wuhan) coronavirus SARS-CoV2 infecting pregnant women: lessons from SARS. MERS, and other human coronavirus infections, Viruses, 12(2).
57. Shimabukuro TT, Kim SY, Myers TR, (2021). Preliminary findings of mRNA Covid-19 vaccine safety in pregnant persons in England. N Engl J Med 2021; 384:2273–82.
58. Sohrabi, C., Alsafi, Z., O'neill, N., Khan, M., Kerwan, A., Al-Jabir, A., ... & Agha, R. (2020). World Health Organization declares global emergency: A review of the 2019 novel coronavirus (COVID-19). International journal of surgery, 76, 71-76.
59. Taha, B. A., Al Mashhadany, Y., Hafiz Mokhtar, M. H., Dzulkefly Bin Zan, M. S., & Arsad, N. (2020). An analysis review of detection coronavirus disease 2019 (COVID-19) based on biosensor application. Sensors, 20(23), 6764.
60. Tefera YG, Gebresillassie BM, Getnet Mersha A and Belachew SA (2020). Beliefs and Risk Awareness on Medications Among Pregnant Women Attending the Antenatal Care Unit in Ethiopia University Hospital. Overestimating the Risks Is Another Dread. Front Public Health. 2020; 8:28. 10.3389/fpubh.2020.00028 - PMC - PubMed
61. Trønnes JN, Lupattelli A, Nordeng H (2022). Safety profile of medication used during pregnancy: results of a multinational European study. Pharmacoepidemiol Drug Saf. 2022;26(7):802–811. doi: 10.1002/pds.4213. - DOI - PMC - PubMed
62. Tuan JJ, Sharma M, Kayani J, Davis MW, McManus D, Topal JE, Ogbuagu O (2023). Outcomes of pregnant women exposed to Sotrovimab for the treatment of COVID-19 in the BA.1 Omicron predominant era (PRESTO). BMC Infect Dis. 2023 Apr 26;23(1):258. doi: 10.1186/s12879-023-08198-9. PMID: 37101135
63. Vasilevski V, Sweet L, Bradfield Z, (2021). Receiving maternity care during the COVID-19 pandemic: Experiences of women's partners and support persons. Women Birth 2021.
64. Villanego F, Mazuecos A, Cubillo B, Merino MJ, Poveda I, Saura IM, Segurado Ó, Cruzado L, Eady M, Zárraga S, Aladrén MJ, Cabello S, López V, González E, Lorenzo I, Espí-Reig J, Fernández C, Osma J, Ruiz-Fuentes MC, Toapanta N, Franco A, Burballa CC, Muñoz MA, Crespo M, Pascual J (2022). Treatment with sotrovimab for SARS-CoV-2 infection in a cohort of high-risk kidney transplant recipients. Clin Kidney J. 2022 Jul 28;15(10):1847-1855. doi: 10.1093/ckj/sfac177. eCollection 2022 Oct. PMID: 36147706
65. Vousden N, Bunch K, Morris E, (2021). The incidence, characteristics and outcomes of pregnant women hospitalized with symptomatic and asymptomatic SARS-CoV-2 infection in the UK from March to September 2020: A national cohort study using the UK Obstetric Surveillance System (UKOSS). PLoS One 2021;16: e0251123.
66. Wan, W. (2020). Pregnant women are more likely to die from the coronavirus, though risk remains small. Washington Post. available @ https://www.washingtonpost.com/health/2020/11/02/covid-pregnant-women-death/
67. World Health Organization. (2021). Infection prevention and control during health care when coronavirus disease (COVID-19) is suspected or confirmed: interim guidance, 12 July 2021 (No. WHO/2019-nCoV/IPC/2021.1). World Health Organization.
68. World Health Organization. (2021). Infection prevention and control during health care when coronavirus disease (COVID-19) is suspected or confirmed: interim guidance, 12 July 2021 (No. WHO/2019-nCoV/IPC/2021.1). World Health Organization.
69. Worldometer. coronavirus/EGYPT. 2021 https://www.worldometers.info/coronavirus/country/egypt/
70. Yassa, M., Birol, P., Yirmibes, C., Usta, C., Haydar, A., Yassa, A., ... & Tug, N. (2020). Near-term pregnant women's attitude toward, concern about and knowledge of the COVID-19 pandemic. The Journal of Maternal-Fetal & Neonatal Medicine, 33(22), 3827-3834.
71. Yefet E, Massalha M, Alter A, Gal Harnik A, Hosari Mahamed S, Novick L, Wattad M, Sakas J, Baram S, Weiss A, Iskander R, Peretz A, Rozenberg O, Younis JS, Perlitz Y, Nachum Z (2023). Should pregnant women be screened for SARS-CoV-2 infection? A prospective multicenter cohort study. Int J Gynaecol Obstet. 2023 Jan;160(1):161-166. doi: 10.1002/ijgo.14359. Epub 2022 Aug 8. PMID: 35842225
72. Yoshida J, Shiraishi K, Tanaka M (2022). Sotrovimab use in Japanese inpatients with COVID-19: post-infusion adverse events. BMC Infect Dis. 2022 Dec 3;22(1):902. doi: 10.1186/s12879-022-07889-z. PMID: 36461006