

Effect of Covid19 Pandemic on Pregnant Women Utilization of Antenatal Care Services

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Abstract

Background: The recent coronavirus disease (COVID-19) pandemic has had a disastrous effect on the health-care delivery system, of mainly pregnancy-related healthcare. **The Aim of study:** Was to assess the effect of Covid19 pandemic on pregnant women utilization of antenatal care services. **Setting:** The study was conducted at outpatient clinical unit in Ain Shams university maternity hospital. A descriptive study design was utilized. **Sampling:** A Purposive sample was used in the current study included (355) Pregnant women at third trimester. **Tool of data collection:** A Structured Interviewing Questionnaire was used divided into five parts. **Results:** 25.4% of studied group were utilized all items of antenatal care services, while 74.6% of studied group were utilized about 3/4 of antenatal care services and considered not utilized. It also indicated that the most common barriers regarding utilization of antenatal care services among pregnant women during covid19 pandemic were fear of exposure to COVID-19 infection during pregnancy, unavailability of antenatal care services as a result of isolation, the waiting list is long and unavailability of nearby places to provide the service that represented (84.5%, 63.4%, 81.7%, 62.5%) respectively. **Conclusion:** The COVID-19 pandemic reduced the utilization of antenatal care services among pregnant women since educational status were the most common factors regarding utilization of antenatal care services. Also, fear of exposure to COVID-19 infection were the most common barriers regarding utilization of antenatal care services. **Recommendations:** Conduct Telemedicine services to overcome lockdown problem during COVID19 pandemic.

Key Word: Antenatal care services, Covid19 pandemic.

Introduction:

Novel Coronavirus-19 causes a very infectious disease resulting in pneumonia and severe respiratory illness. It has emerged as an outbreak towards the end of the year 2019 and has been declared as global pandemic by WHO (World Health Organization). Covid-19 disease was first reported in Wuhan, Hubei Province, China in December 2019 and is associated with high morbidity and mortality across the world. The disease mainly affects adults with higher mortality rate in elderly and compromised people (*World Health Organization, (2021)*).

Coronavirus disease-19 (COVID-19) causes severe problems as, acute respiratory distress syndrome (ARDS), pneumonia, multi-organ failure, septic shock and cardiovascular complications may include heart failure, arrhythmias, heart inflammation, and

thrombosis, particularly venous thromboembolism. In addition to Neurologic complications include seizure, stroke, encephalitis and death (*Carod-Artal, 2020*).

The preventive measures have been taken such as social distancing, compulsory lockdown, and restriction of activities to prevent spread of virus. The norms of social distancing by patients and wearing personal protective equipment by hospital staff, testing of pregnant women should be followed as per regional and national guidelines. This will help ensure safety of all people along with care to the expecting women. The presence of covid-19 infection should not prevent women from receiving antenatal care and provide appropriate treatment during labor (*Mhlanga-Gunda, 2022*).

Covid19 pandemic and general preventive precautions has posed problems to

both the pregnant women and maternity care workers. The care and management of pregnant women is an essential service to identify high-risk women and to have good pregnancy outcome for both mother and baby. Any delay in this management may lead to catastrophe; hence this issue needs to be addressed properly. Pregnancy is not very adversely affected by the virus itself, but extra caution should be taken for prevention and complications should they arise (*Gawali Mangesh, 2021*).

The COVID-19 pandemic has been extremely disruptive to health systems and services worldwide. Early data indicate that the pandemic has decreased women's use of ANC, including in low-income and middle-income countries. The impact of COVID-19 pandemic influence worldwide health system, essentially disturbing care provision with high levels of morbidity and mortality. With more than 56 077335 cases and 1 346248 and above deaths were reported globally, numerous nations have executed strict social distancing rules with full or halfway lockdowns again in second wave. COVID-19 also disturbing health, social welfare and the economy in an extent unparalleled in present day history (*Robertson, 2020*).

Antenatal care (ANC) is defined as the care provided by health care provider to all pregnant women to ensure the best health conditions for the women and their fetuses during pregnancy. The basic components of the ANC include risk identification, prevention, and management of pregnancy-specific or concomitant diseases, education and health promotion through providing advice, education, reassurance, and support; to address and treat the minor problems of pregnancy; and to provide effective screening during the pregnancy (*Mubangizi, 2022*).

Nurses must integrate their multidisciplinary professional roles for caring of pregnant women with implementing a proper nursing care to improve women's general health condition during pregnancy. Additionally, They are provide adequate information, instruction

and preventive measures to pregnant woman about COVID-19 disease, to reduce risk of transmission of COVID-19, including, Maintain social distancing at least 1-2 meter (3-6 feet) distance from others (*Gamberini, 2022*).

Moreover, conduct counselling session using simple guided brochures and posters to correct misconcept and misbeliefs regarding utilization of antenatal care services during covid19 pandemic, and explain signs, symptoms mode of transmission, complication of covid19 Also, nurses can provide psychological support applying principles of therapeutic communications keep in mind factors influencing women's utilizing of ANC services. And creating proper awareness about important of antenatal care, component, follow up visits scheduling, and danger signs during pregnancy (*Nishimwe & Mchunu, 2022*).

Justification of the study:

The COVID-19 pandemic is posing considerable challenges for countries to maintain the provision of high quality, essential maternal and newborn health services. Pregnant women and mothers with newborns may experience difficulties accessing services due to transport disruptions and lockdown measures or be reluctant to come to health facilities due to fear of infection. *UNICEF, (2020)*. Thus, a modest decline of 10% in coverage of pregnancy related and newborn health-care services were reported due to pandemics. This would result in 28,000 maternal deaths. *ICF, EPHI, (2019)*.

In addition, disruption of maternity services and diversion of resources away from essential pregnancy care, because of prioritizing the COVID-19 response, increased risks of maternal morbidity and mortality. Anxiety and obsessive-compulsive symptoms in pregnant women were found to be increased during the current SARS-CoV-2 pandemic (*Yassa, 2020*). A little is known about the effect of covid-19 disease on health of pregnant women. There are case reports and case series on coronavirus disease in pregnancy, but a large proportion of data is still unpublished and hence, unknown

Zhu, (2019) & Zaki, (2021), There for this study was carried out to assess the effect of Covid19 pandemic on pregnant women utilization of antenatal care services.

Aim of the study:

The current study was aimed to assess the effect of Covid19 pandemic on pregnant women utilization of antenatal care services.

Research question:

- What is the effect of covid19 pandemic on pregnant women utilization of antenatal care services?
- What are the barriers that prevent pregnant women utilization of antenatal care services during covid19 pandemic?

Subjects and Methods

The study was portrayed under four main designed as the follows:

1. Technical design
2. Administrative design
3. Operational design
4. Statistical design

1. Technical design:

The current technical design was used for the study covers the following main heading:

a) Research design:

A Descriptive study was used.

b) Research setting:

The study was conducted at Ain Shams university maternity hospital (outpatient clinical unit) that contain three floors, the first floor has a prenatal clinic, the second floor has family planning clinic and a laboratory for investigation and third floor has gynecology clinic as Ain Shams university maternity hospital is a university hospital so expected to meet large number of pregnant women.

c) Subjects:

Sample type: A Purposive sample was used in the current study with the following inclusion criteria.

Inclusive Criteria:

- Pregnant women at third trimester.
- Prime and multi gravida.
- Pregnant women agree to participate with study.

Exclusive Criteria:

- Pregnant women at first and second trimester.

Sample size: 355 pregnant women were participated in the study according to the following formula:

$$n = \frac{N \times p(1-p)}{\left[\left[N - 1 \times (d^2 + z^2) \right] + p(1-p) \right]}$$

$$355 = \frac{4320 \times 0.50(1-0.50)}{\left[\left[4320 - 1 \times (0.05^2 + 1.96^2) \right] + 0.50(1-0.50) \right]}$$

N= Community size

z= Class standard corresponding to the level of significance equal to 0.95 and 1.96

d= The error rate is equal to 0.05

p= Ratio provides a neutral property = 0.50

Study subjects include a representative of total pregnant women at third trimester in outpatient clinical units attendance rate (N=4320) at Ain Shams University Maternity Hospital; were hospitalized during the period 2019-2020. Based on sample size equation 355 women were participated in the study.

So, the sample size was calculated by adjusting the power of the test to 80% and the confidence interval to 95% with margin of error accepted adjusted to 5% and a known total population of 355 women using the following equation:

- Type I error (α) = 0.05
- Type II error (B) = 0.2
- With power of test 0.80

Tools of data collection:

* Tool was used in the study to achieve the aim as the following:

I.A structured interviewing questionnaire:

It was adopted from (*Tadesse, 2020 (Roozbeh, 2016 & Kopelman, 2008)*) and modified by the researcher in an Arabic language to assess effect of covid19 pandemic on pregnant women utilization of antenatal care services it include (50 question, multiple choice & closed end questions) divided into five parts as follows:

- **Part I: First part:** Assessed general characteristics of the pregnant women under study, such as age, residence, educational level, marital status, income and occupation (1-6 questions).
- **Part II:** Designed to assess, Medical history, surgical history and family history it include (8 closed end question).
- **Part III:** Including obstetric history as (Gravida, parity, number of abortion), previous pregnancy, labor, and postpartum complications, present pregnancy history and present complain (14 closed end question) .
- **Part IV:** Designed to assess, Extent of pregnant women utilization of antenatal care services during covid19 pandemic it consisted of (9 closed end question) as:
 - Take a comprehensive medical history.
 - Perform Laboratory tests during pregnancy including; (Hemoglobin, Blood sugar, Urine glucose and albumin analysis, The x-rays during pregnancy, Ultrasound, 3D rays, 4D rays and Fetal Doppler).
 - Receive nutritional supplements such as iron and folic acid.
 - Get pregnancy vaccinations
 - Receiving health education from the medical team during visits.

Scoring system for evaluating pregnant women utilization of Antenatal care services during Covid19 pandemic will be developed as the following:

Each question will be scored as **3** for regular utilization, **2** for irregular utilization (when indicated only) and **1** for no utilization, the total score will be calculated as the following:

Utilized if total score is equal or more than **60%**, Not utilized for less than **60%**.

- **Part IIV:** The present study concerned with the barriers that prevent pregnant women utilization of antenatal care services during covid19 pandemic (11 closed end question) as:
 - Fear of exposure to COVID-19 infection during pregnancy.
 - Transportation to the place of antenatal care services is not available.
 - I cannot afford the cost of follow-up.
 - Unavailability of a medical team to provide antenatal care services because it was directed to the isolation team.
 - Unavailability of antenatal care services as a result of isolation.
 - Unavailability of nearby places to provide the service

Tools validity:

Tools of the study given to three panel expertise in the field of obstetric and gynecological nursing to test the content validity of the tool and Clarifies the sentences as well as. Appropriateness of content, modification was done and rephrasing to some statement.

The reviewing current and past, national and international related literature and theoretical knowledge of various aspects of the study using books, articles, internet, periodicals and magazines to develop tools for data collection.

Tools Reliability:

Testing reliability of proposed tools was done by Cronbach alpha test

That was calculated to assess the reliability that indicated the tool consisted of reliability homogenous items as indicated by the moderate to high reliability the Cronbach alpha test was **(0.82)** for A structured Interviewing Questionnaire.

Ethical Consideration:

- The researcher approval obtained from Scientific Research Ethical committee in faculty of nursing at Ain Shams University before starting the study.
- Then Official permission was obtained from the director of the Ain Shams University Maternity Hospitals where the study conducted
- The researcher clarified the objective and aim of the study to the pregnant women included in the study.
- The researcher ensuring and maintaining anonymity and confidentiality of the subject data.
- Women's informed that they are allowed to choose to participate or not in the study and that they have the right to withdraw from the study at any time.
- Tools of data collection did not touch women's religious, dignity, culture, and ethical issues.

2. Administrative design:

An official permission letter containing the title and purpose of the study was sent to the director of the Ain Shams University Maternity Hospitals.

1. Operational design:

The operational design included preparatory phase, pilot study and field work.

I. Preparatory phase:

That was the first phase of the study and that included reviewing current and past, local and international related literature and theoretical knowledge of various aspects of the study using books, articles, internet, periodicals and magazines to develop tools for data collection.

2. Pilot Study:

The pilot study was carried out on 10% among the total studied sample, which was included (36) women who met the inclusion criteria to assess practicability, content validity and reliability of tools. No modification was

done. So, the pilot study sample wasn't excluded from the study.

3. Field Work:

- The study was implemented within 6 months from October to March 2021 .The researcher attended the previously mentioned study setting 3days/week (Sunday & Tuesday& Thursday) from 9.00 am to 2.00 pm until the total sample was obtained .the researcher took in consideration the universal precautions against Covid 19 and hospital rules regarding its prevention while interviewing pregnant women as: keep appropriate distance from other sitting 2 arm's length apart from each other, follow frequent hand washing and using alcohol gel and wear surgical mask
- The researcher had interviewed with (7-10) women per day with previously mentioned sample criteria each interview had consumed 20-25 min.
- Firstly the researcher had started interview with each pregnant woman individually by introducing her-self, explained the aim of the study, and obtained oral consent from them.
- Then the researcher assessed general characteristics, medical history, surgical history, family history.
- Then the researcher assessed obstetric history including (Gravida, parity, and number of abortion), previous pregnancy, labor, and postpartum complications, present pregnancy history, present complains.
- Then the researcher assessed the Extent of pregnant women utilization of antenatal care services for the first, second and third trimesters during covid19 pandemic.
- Finally the researcher assess barriers that prevent pregnant women utilization of antenatal care services during covid19 pandemic including (first, second and third trimester).

Statistical design:

The statistical analysis of data was done by using the computer software of Microsoft Excel Program and Statistical Package for Social Science (SPSS) version 25. Data were presented using descriptive statistics in the form of frequencies and percentage for categorical data, the mean (X) and standard deviation (SD) for quantitative data. Qualitative variables were compared using chi square test (X²), P-value to test association between two variables and Pearson correlation test (R- test) to the correlation between the study variables, and Cronbach alpha test for reliability results. Degrees of significance of results were considered as follows:

- P-value > 0.05 Not significant (NS)
- P-value ≤ 0.05 Significant (S)
- P-value ≤ 0.01 Highly Significant (HS).

Results:

Table (1): shows that (50.1%) of women's age ranged between (25 to 35) years with mean age (28.7±9.2). as well as (71.3%) of studied group lived in urban area, (98%) from studied group were married, and (50.7%) among study group had secondary level of education while (6.7%) was illiterate. As regard working status, (64.8%) among studied group doesn't work. In addition to (54.9%) among them hadn't enough income.

Table (2): Shows that (56.3%, 72.4%, 76.9%, 77.5% and 84.5%) never utilized of antenatal assessment in form blood sugar test, Urine glucose and albumin analysis, 3D rays, 4D rays and fetal Doppler during pregnancy respectively. While (26.8%, 21.1%, 50.7%) had some time utilized of antenatal assessment in form of taking a comprehensive medical history, hemoglobin for laboratory test and receiving nutritional supplements during pregnancy such as iron and folic acid respectively. On the other hand (56.3%, 64.8%, 100%, and 81.7%) of studied group had always utilization of antenatal

assessment in form of comprehensive medical history, haemoglobin for laboratory tests, ultrasound and vaccination during pregnancy respectively.

Table (3): indicates that there were a statistical significant difference between studied group total extent of utilization of antenatal care services during covid19 pandemic and obstetric history in form of gravida (**p value =.049**), Para (**p value =.047**) and their Number of abortions (**p value =.017**).

Table (4): indicates that there were highly statistical significant differences between total extent of utilization of antenatal care services during covid19 pandemic and their current pregnancy history of studied group in form of antenatal follow-up (**p value =.001**) and their causes of current visit (Follow-up- Health problems) (**p value=.005**). Also indicates that there were a statistical significant differences between studied group total extent of utilization of antenatal care services during covid19 pandemic and their Current pregnancy history in relation to duration in weeks (**p value =.035**), their current pregnancy complications (**p value =.041**) and their fetus suffer from any health problems or birth defects (**p value =0.01**).

Table (5): Shows that there were highly statistical significant relations between studied group extent of utilization of antenatal care services during covid19 pandemic and barriers of utilization in form of fear of exposure to COVID-19 infection during pregnancy (**p value =.005**), Cannot afford the cost of follow-up (**p value =.000**), Unavailability of a medical team to provide antenatal care services due to directed them to the isolation team (**p value =.000**), Unavailability of antenatal care services as a result of isolation (**p value =.000**), The waiting list is long (**p value =.007**) and Unavailability of nearby places to provide the service (**.001**).

Part (I): General characteristics of the pregnant women.

Table (1): Number and percentage distribution of the pregnant women according to their general characteristics.

Socio-demographic characteristics	Sample size (n = 355)	
	N	%
Age		
< 20 yrs.	50	14.1
20-<25 yrs.	105	29.6
25-<35 yrs.	178	50.1
≥ 35 yrs.	22	6.2
Mean SD	28.7±9.2	
Residence		
Rural	102	28.7
Urban	253	71.3
Marital status		
Married	348	98
Divorced	7	2
Educational level		
Illiterate	24	6.7
Read and write	36	10.1
Primary education	40	11.3
Preparatory education	30	8.5
Secondary education	180	50.7
High education	45	12.7
Occupation		
Working	125	35.2
Not working	230	64.8
Economic income		
Enough	104	29.3
Not enough	195	54.9
Barely enough	56	15.8

Part (II): Extent of Pregnant women utilization of antenatal care services during covid19 pandemic.

Table (2): Number and percentage distribution of the pregnant women according to their utilization of antenatal assessment during covid 19 pandemic.

Items	Pregnant women (n = 355)					
	Never		Sometimes		Always	
	N	%	N	%	N	%
History taking						
Take a comprehensive medical history	60	16.9	95	26.8	200	56.3
Laboratory tests during pregnancy						
Hemoglobin	50	14.1	75	21.1	230	64.8
Blood sugar	200	56.3	95	26.8	60	16.9
Urine glucose and albumin analysis	257	72.4	70	19.7	28	7.9
The x-rays during pregnancy						
Ultrasound	0	0.0	0	0.0	355	100
3D rays	273	76.9	52	14.6	30	8.5
4D rays	275	77.5	60	16.9	20	5.6
Fetal Doppler	300	84.5	35	9.9	20	5.6
Receive nutritional supplements such as iron and	80	22.5	180	50.7	95	26.8

folic acid						
Get pregnancy vaccinations	65	18.3	0	0.0	290	81.7

Table (3): Relationship between previous obstetric history of the pregnant women and their total Extent of utilization of antenatal care services during covid19 pandemic (n=355).

Previous obstetric history		Total Extent of utilization of antenatal care services during covid 19 pandemic				X ²	P-Value
		Extent of utilization (n=90)		Not-utilized (n=265)			
		N	%	N	%		
Gravida	1	5	5.6	80	30.3	9.041	.049*
	2-3	75	83.3	130	49.1		
	4-5	5	5.6	47	17.7		
	>5	5	5.6	8	4.5		
Para	None	5	5.6	140	52.8	9.099	.047*
	1-2	72	80	88	33.2		
	3-4	9	10	35	13.2		
	>4	4	4.4	2	0.8		
Number of abortions	None	35	38.9	260	98.1	11.30	.017*
	One	40	44.4	5	1.9		
	Two	15	16.7	0	0.0		

Table (4): Relationship between current pregnancy history of the studied women and their total Extent of utilization of antenatal care services during covid 19 pandemic (n=355).

Current pregnancy history		Total Extent of utilization of antenatal care services during covid 19 pandemic				X ²	P-Value
		Extent of utilization (n=90)		Not-utilized (n=265)			
		N	%	N	%		
Current pregnancy duration in weeks	27-< 32	10	11.1	100	37.7	10.58	.035*
	32-<36	74	82.2	129	48.7		
	≥ 36	6	6.7	36	13.6		
current pregnancy complications	Yes	90	100	175	66	9.997	.041*
	None	0	0.0	90	34		
Fetus suffer from any health problems or birth defects	Yes	48	53.3	0	0.0	12.41	0.01*
	No	42	46.7	265	100		
Antenatal follow-up	Yes	90	100	235	88.7	13.57	.001**
	No	0	0.0	30	11.3		
Causes of current visit	Follow-up	85	94.4	80	30.2	13.15	.005**
	Health problems	5	5.6	185	69.8		

*Statistical significant at p <0.05.

**highly significant at p < 0.01.

Table (5): Relationship between barriers that prevent pregnant women utilization of antenatal care services and their total Extent of utilization of antenatal care services during covid 19 pandemic (n=355).

Barriers that prevent utilization of antenatal care services		Total Extent of utilization of antenatal care services during covid 19 pandemic				X ²	P-Value
		Extent of Utilization (n=90)		Not-utilized (n=265)			
		N	%	N	%		
Fear of exposure to COVID-19 infection during pregnancy	Yes	35	38.9	265	100	13.65	.005**
	No	55	61.1	0	0.0		
Cannot afford the cost of follow-up	Yes	0	0.0	185	69.8	17.41	.000**
	No	90	100	80	30.2		
Unavailability of a medical team to provide antenatal care services due to directed them to the isolation team	Yes	0	0.0	206	77.7	16.47	.000**
	No	90	100	59	22.3		
Unavailability of antenatal care services as a result of isolation	Yes	0	0.0	225	84.9	17.85	.000**
	No	90	100	40	15.1		
The waiting list is long	Yes	25	27.8	265	100	14.07	.007**
	No	65	72.2	0	0.0		
Unavailability of nearby places to provide the service	Yes	0	0.0	222	83.8	15.15	.001**
	No	90	100	43	16.2		

**highly significant at p < 0.01.

Discussion:

Antenatal care services have been affected by the COVID-19 pandemic. Pregnant women face additional challenges during social distancing because of their contribution to the workforce, as caregivers, and the need to attend antenatal care. As well as movement restrictions, transport challenges, and anxiety over possibly being exposed to coronavirus are acting as the barrier to maternal health service utilization (Tolu., 2021).

Regarding general characteristic of Pregnant women, the results of the present study revealed that the pregnant women understudy in the age group from 25 to 35 years constitute the highest percentage among the studied group and most of them were married, and only a minority of them were divorced. This may be due to that marriage often occurs after

the age of 20 years according to Egyptian society culture and women are typically married and give birth between the ages of 18 and 35 years old as reported by *Samari, (2017)*. This result agreed with *Tadesse, (2020)*, who studied the Antenatal care service utilization of pregnant women attending antenatal care in public hospitals during the COVID-19 pandemic period and found that most of the pregnant women are in their active productive stage of life in the age group 25-35 years and the majority of them were married.

Regarding the residence area of the pregnant women understudy, this study indicates that more than two-thirds of the studied women were from urban areas, this may be due to increase health services provided and increase knowledge of pregnant mothers about the availability of antenatal care services and their importance in urban areas than rural areas.

This result is in agreement with *Ali & Abo-Kresha, (2021)*, who studied the Patterns and Determinants of Utilization of Antenatal Care Services by Pregnant Women in Egypt and reported that most pregnant women in their study are residing urban areas. These results are inconsistent with *Khadr, (2020)*, who found that the most of studied women in his study reside in rural areas due to a shortage of antenatal care services in rural areas

Regarding the educational level and income, this study revealed, that more than half of the study groups were in secondary education and had not enough income, only a minority of them were highly educated and had barely enough income. This finding may be due that most women who visit the governmental hospital are of low socioeconomic status and had not enough income to visit private hospitals. These results were, in accordance with *Ali, Ramadan, & Ahmed, (2022)*, in their study which entitled Knowledge, Attitude, and Practice toward Corona Virus Infection among Pregnant Women Attending Antenatal Care Clinics at Kafrelsheikh, Egypt, and they reported that most the pregnant women in their study were secondary education and had not enough income. However, these results are inconsistent with *Lelissa et al. (2015)*, who found that most of the women in their study were college graduates and elementary school.

As regards working status, this study reveals that relatively two-thirds of the pregnant women under study were not working. This could be due to that the study group was females and most of them are not educated. This result is in agreement with *Khadr, (2020)*, who found that more than two-thirds of the study sample was not working.

Concerning pregnant women's utilization of antenatal care services during the covid19 pandemic, the present study finding indicated that above half of the studied group had always utilized the antenatal assessment of comprehensive medical history and most of them have always checked hemoglobin for laboratory tests, get pregnancy vaccinations and

all studied group always made ultrasound. Also, the current study findings reported that more than a quarter of the study group had sometimes utilized antenatal assessment in form of taking a comprehensive medical history, and above half of the study sample never utilized antenatal assessment for blood sugar tests, nearly two-thirds of them never do Urine glucose, albumin analysis, 3D rays, 4D rays.

This could be attributed to the higher prevalence of anemia among the pregnant women understudy and anemia is a major risk factor for the unfavorable outcome of pregnancy both for the mother and the fetus and, antenatal care services enable early identification of pregnancy-related risks and complications so, they should always make a comprehensive assessment of medical history and should always check hemoglobin for laboratory tests as one of the core interventions for improving maternal outcomes. In relation to that, all studied groups always made ultrasound that could be related to that, anemia has been associated with premature labor and low birth weight so they should do ultrasound examination as a means of early detection and prevention of complications.

In relation to other investigations, the study results showed that above half of the study group never utilized antenatal assessment for blood sugar tests, and nearly two-thirds of them never do Urine glucose, albumin analysis, 3D rays, and 4D rays.

This finding could be due to the that, antenatal care services, are not as strong in health institutions and governmental hospitals in developing countries as in the developed world, these services are the main mechanism for safe motherhood interventions and are believed to reduce maternal and perinatal mortality. This finding agrees with *Gebreyohannes, (2017)*, who reported that the accuracy of the HGB measurement used should be taken into account because the HGB is the value of the pregnant woman's early detection and treatment of any complications.

On the other hand, this result disagreed with *Halle-Ekane, (2017)* who reported that the majority of women attending antenatal care services had weight measurement, general and obstetric examination (abdominal palpation and auscultation of fetal heart tones), blood and urine tests, blood pressure measurement, iron, folic acid and tetanus toxoid administration. The difference between the two studies may be due to the fact that the current study was done during the covid19 pandemic, but the other study was done before the covid19 pandemic in which intentional choices were made in responding to the pandemic.

In relation to the total level of utilization of antenatal care services during the covid19 pandemic. The current study results demonstrated that nearly three-quarters of the pregnant women under study not utilized antenatal care services during the covid19 pandemic, while only about one-quarter of them utilized antenatal care services due to pregnancy complications. This may be explained by the fact that the COVID-19 pandemic is posing considerable challenges for countries to maintain the provision of high-quality, essential maternal and newborn health services. Pregnant women and mothers with newborns may experience difficulties accessing services due to fear of infection, transport disruptions, and lack of awareness about the importance of follow-up and caring during pregnancies or be reluctant to come to health facilities due to shortfalls in the health system.

This result was consistent with the data from *UNICEF, (2020)* which entitled Maternal and newborn health and COVID-19 which concluded that the majority of health facilities being ill-equipped to deal with the pandemic. In addition, these findings are also supported by a study entitled "Factors affecting the utilization of a minimum of four antenatal care services in Ethiopia" which was done by *Basha, (2020)* and pointed out that approximately a quarter of participants were pregnant women who attended the obstetric outpatient clinics fully utilized the antenatal care services during the covid19 pandemic. This agreement is due to most

pregnant women having anxiety and stress from covid19 transmission and infection during pregnancy.

As regards the relationship between the previous obstetric history of the pregnant women and their total extent of utilization of antenatal care services during covid19 pandemic, this study finding revealed that there were statistically significant relations between the studied group's total extent of utilization of antenatal care services during covid19 pandemic and their obstetric history, in which pregnant women under study who utilizes antenatal care services were primipara and most of them were had pregnancy complications and more than two-fifth of them had an abortion for one time.

This may be due to that primipara may not have any experience with pregnancy and delivery and utilize antenatal care services to receive a comprehensive assessment and follow-up and to receive health teaching about pregnancy and delivery and to make sure that they have no problems that affect their child as well as the women who had the previous history for abortion utilize antenatal care services for follow up their pregnancy and prevent abortion for other time and to prevent any complication. Also, This result disagreed with *Halle-Ekane, (2017)*. Who reported that the majority of women attending antenatal care services (greater than 98%) had a previous medical history or obstetric history as abortion or complication of pregnancy.

As regards the relation between barriers that prevent pregnant women's utilization of antenatal care services and their total extent of utilization of antenatal care services during covid 19 pandemic. The current study shows that there were highly statistically significant relations between the studied group's extent of utilization of antenatal care services during covid19 pandemic and barriers to utilization of antenatal care services in which the studied group who did not utilize antenatal care services reported that they fear of exposure to COVID-19 infection during, unavailability of a medical team to provide antenatal care services due to direct them to the isolation team, unavailability of antenatal care

services as a result of isolation, the waiting list is long, unavailability of nearby places to provide the service and cannot afford the cost of follow-up.

This may explain that antenatal care services are essential primary preventive health services to reduce maternal and morbidity rates, but also concerns about the utilization of health services are increasing due to the worldwide fear of COVID-19. This situation causes disruptions in antenatal care services. These results are consistent with data from the United Nations International Children's Emergency Fund (*UNICEF, 2019*) which reported that nearly half of countries worldwide experience problems in using antenatal care services related to covid 19 pandemic.

Conclusion:

Based on the result of present study, the following can be concluded:

The result of the present study supported the research questions:-

These findings of this study were concluded that the COVID-19 pandemic reduced the utilization of antenatal care services among pregnant women since educational status, History of chronic diseases, bad obstetric history were the most common factors regarding utilization of antenatal care services.

Additionally, the study was concluded that fear of exposure to COVID-19 infection, follow-up costing, unavailability of antenatal care services and medical team due to the isolation, Unavailability of antenatal care services as a result of isolation, the waiting list is long and unavailability of nearby places were the most common barriers regarding utilization of antenatal care services.

Recommendations:

Based on the finding of the current study, the following recommendations are suggested:

- Design and implement antenatal care counseling sessions to increase pregnant

women's awareness regarding important of utilization of antenatal care services.

- Hospital administrators must pay attention for designing simple guided brochures and posters regarding effective preventive measure to control transmission of COVID-19 infection among pregnant women at Ain Shams university maternity hospital (outpatient clinical unit).
- Conduct health educational programs for pregnant women to protect the health of themselves and their babies after delivery.
- Arrangements should be made by WHO for assuring proper means of transportation and availability of MHS (maternal health services) during lockdown.
- Telemedicine services to overcome lockdown problem during COVID19 pandemic.

Further study:

- Replication of the study on large sample size of pregnant women and their outcome in different hospitals to investigate the effect of COVID19 pandemic on pregnant women utilization of antenatal care services and there outcome for generalizing the finding.

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