

Effect of COVID-19 Vaccine Instructional Guideline on Pregnant Women's Knowledge and Intention

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Abstract

Herd immunity through vaccination is the target of public health interventions against COVID-19, but vaccine refusal or hesitancy and the little knowledge available for pregnant women due to ignorance of the vaccine's mode of action are the global threats that make the achievement of community immunity very difficult. **Aim:** The study aimed to evaluate the effect of COVID-19 vaccine instructional guidelines on pregnant women's knowledge and intention. **Design:** Quasi-experimental research design was used in this study. **Setting:** It was conducted at El-fayoum university hospital in the antenatal clinic. **Sample:** Convenient sample of 200 pregnant women. **Tools:** structured interviewing questionnaire sheet composed of five parts to collect the following data socio-demographic data, past obstetric history, present obstetric history, women knowledge regarding Covid 19 vaccination and pregnant woman intention of Covid -19 vaccination. **Results:** There were highly statistically significant differences between pre & post-test regarding knowledge and intention about covid-19 vaccination and highly statistically significant between total knowledge and intention of studied pregnant women regarding COVID-19 vaccination at pre and post-implementation. **Conclusion:** There was an improvement in pregnant women's knowledge and intention regarding covid-19 vaccination post implementation of the instructional guideline. **Recommendations:** implementation of public health intervention programs to alter unfavorable beliefs and enhance Egyptians' acceptance and uptake of the COVID-19 vaccine.

Keywords: Instructional guideline, Covid19 vaccine, Knowledge, Intention.

Introduction:

The coronavirus disease 2019 (COVID-19) pandemic caused a major public health crisis around the world and is expected to continue to impose enormous burdens of morbidity and mortality (Lazarus, et al., 2020). WHO announced a global coronavirus disease pandemic 2019 (COVID-19) caused by extreme coronavirus acute respiratory syndrome (SARS-COV-2). Both pregnant women and their fetuses are considered at high risk of transmitting infectious diseases during outbreaks in vulnerable populations (WHO, 2020).

Most studies of COVID-19 pregnancy cases have been either asymptomatic or self-limiting pneumonia. Immunological and physiological adaptations during pregnancy make women more susceptible

Than the general population to SARS-COV-2 infection. In addition, cases of serious illness have been reported among pregnant women with co-morbidities such as diabetes, preeclampsia, and cardiovascular disease (UNPF, 2020).

Despite the low overall likelihood of severe sickness, pregnant women are more susceptible to COVID-19-related severe illness than non-pregnant women. In addition, pregnant women with COVID-19 infection may be more likely than pregnant women without the virus to experience unfavorable pregnancy outcomes, such as low birth weight and premature delivery. Another crucial front in the fight against the pandemic is examining the barriers that prevent pregnant women from wanting to receive the COVID-19 vaccine (Hailemariam et al., 2021).

Widespread vaccination is important for COVID-19 transmission control. However, despite the pandemic, there is a global distrust of vaccine safety and efficacy. Planned behavior theory explains whether or not a person will adhere to a particular behavior. Regarding the COVID-19 vaccine, it is dependent on three major factors: the individual's general attitudes toward vaccination in general and the COVID-19 vaccine in particular, the attitudes of 'significant others' toward the vaccine, and the perceived behavioral control, which refers to the perceived difficulty in doing the behavior **(Omar and Hani, 2021)**.

Several COVID-19 vaccines have been approved worldwide. According to Bloomberg figures, more than 3.51 billion doses had been provided in 180 countries. The most recent figure was around 30.5 million doses each day. Over 3.51 billion doses have been given out, which is enough to vaccinate 22.9 percent of the world's population. Egypt's immunization rate is relatively low; 4851349 doses were delivered to 2.4 percent of the population **(Zewude et al., 2021)**.

Vaccine for SARS-CoV-2 is the most promising mean of controlling the spread of the COVID-19 pandemic. On the one hand, the Joint Committee on Vaccination and Immunization (in line with recommendations from the USA and the WHO) advises that pregnant women should be offered COVID-19 vaccines at the same time as people of the same age or risk group and recommends that the vaccines can be received while breastfeeding **(Garg et al., 2021)**.

The COVID-19 pandemic persists with resurgent waves while debates intensify about reinstating lockdowns, civil liberties, and societal livelihood. Vaccines have become the hopeful savior to end the worst global health and economic crisis of living memory. Beyond the complex logistics of developing and testing, mass manufacturing, and distribution, the public's confidence and acceptance of the vaccines are unclear and changing, rendering achieving herd immunity a challenge **(Reiter et al., 2020)**.

Concerns about the COVID-19 pandemic, inaccurate information about the advantages, a lack of confidence in the safety or confidence, acceptance of vaccines, and adherence to infection control guidelines were among the factors that prevented vaccination adoption, **(Fisher et al., 2020)**. While the SARS-CoV-2 pandemic has seen millions of women become pregnant, give birth, and start nursing, it is critical to comprehend patient perspective and barriers to vaccination adoption as a crucial key aspect in trying to end the pandemic. To the best of our knowledge, there is no information on whether pregnant women accept vaccines **(El-Elimat et al., 2021)**.

Vaccine acceptance is just as important to its success as its effectiveness. Without universal acceptance, even the best immunizations cannot stop the disease. Despite improvements in vaccine administration and development, the community immunity level still needs to reach at least 75% to meet the criteria for creating so-called herd immunity and halt the spread of the SARS-CoV-2 pandemic. according to WHO, is vaccination hesitancy. This knowledge goes back to before the SARS-CoV-2 outbreak. Because of this, it is crucial to comprehend and identify the basis for vaccine skepticism as well as the degree of vaccine acceptance **(Ayhan et al., 2021)**.

By giving pregnant women trustworthy information about the safety, efficacy, and recommendations of scientific societies, health professionals, including midwives, can lower the level of anxiety related to the vaccination against COVID-19. This may help to increase the acceptance of the COVID-19 vaccination among pregnant women **(Januszek et al., 2021)**.

Significance of the study:

The coronavirus disease 2019 (COVID-19) is spread rapidly and reached about 221

countries in the world. Globally, 123, 942, 893 people were infected by the virus, and 2, 729, 111 died as of 22 March 2021 (Hailemariam et al., 2021). According to the Center for Disease Control and Prevention (CDC, 2021), the total number of cases of pregnant women with COVID-19 in the USA is 225, 656 women with total death of 306 as of 25 July 2022.

Egypt's Ministry of Health and Population in February 2020, declared the first COVID-19 infection, and there have been 515,198 cases of COVID-19 with 24,786 deaths confirmed in August 2022 Egypt (WHO, 2022). Vaccination is the most successful and cost-effective health intervention and critical method for lowering infections and disease severity in the present coronavirus disease 2019 (COVID-19) pandemic (Jayagobi et al., 2021), but the major obstacle to the implementation of the vaccination program is vaccine hesitancy (Fares et al., 2021). Also, initial studies on COVID-19 vaccine uptake predicted extraordinary difficulties for universal vaccination. (Lazarus et al., 2020).

Although widespread vaccination against COVID-19 may out to be the most efficient strategy to stop this fatal epidemic, public fear and reluctance regarding vaccination still exist. The government has planned a vaccination program to reach herd immunity against the disease for those people who are more vulnerable to the pandemic than the general population. Pregnant women make up a significant component of the population with special concerns about COVID-19 vaccination (Sutton et al., 2021).

Aim of the study

The current study aimed to evaluate the effect of COVID-19 vaccine instructional guidelines on pregnant women's knowledge and attitude.

Research questions:

What is the effect of COVID-19 vaccine instructional guidelines on pregnant women's knowledge and intention?

Operational Definition:

COVID-19 vaccine: Vaccination is one of the most effective methods of controlling the COVID-19 pandemic by building herd immunity within the population.

Intention: willing or unwilling to take the vaccine.

Research Hypotheses:

The pregnant women's knowledge and intention toward COVID-19 vaccination will be improved after receiving the instructional guideline.

Subjects and Methods:

Research Design: A quasi-experimental pre and post-test one-group-only design was adopted to carry out this study.

Setting:

The current study was carried out at the Antenatal Outpatient Clinics at Fayoum University Hospital. Obstetrics and Gynecology Department consist of two big wards, antenatal outpatient clinics, and a reception department, one ward consists of antenatal room, sonar room, postpartum examination room, and the other ward consist of the gynecological examination room, nursing room, and medical room. This hospital has a higher rate of women attendance from both rural and urban areas in fayoum city.

Subjects:

Sample type: A convenient sample was used in this study.

Sample Size: 200 pregnant women were attending the previously mentioned setting and seeking antenatal care (ANC) services within 6 months beginning from January 2022 to the end of June 2022.

Sample size was calculated based on **Thompson's (2012)** equation; using the following parameters: population size (415),

probability (50%), Z at 95% confidence level (1.96), and error proportion d (0.05).

Inclusion criteria of the sample selection:

Pregnant women within the age group >18 year, and Women who agreed to participate in this research.

Exclusion criteria:

Pregnant women who were unable to respond due to illness or other physical impairments such as Pregnancy Induced Hypertension (PIH), Gestational Diabetes Mellitus (GDM), and heart disease to rule out the effect of other factors on study outcomes.

Tools of data collection:

Data was collected to fulfill this study. It was developed by the researcher after reviewing related literature and consists of one tool:

Structured interviewing questionnaire includes:

Part I: Socio-demographic data included: (Name, age, residence, educational level, occupation, etc.).

Part II: Data related to past obstetric history include (number of gravidity, number of parity, number of abortions, no of living children, etc.).

Part III: Data related to present obstetric history included: gestational age, regular attendance of antenatal visits, and source of information regarding COVID-19 vaccination.

Part IV: Women's knowledge regarding covid-19 vaccination. The questionnaire consists of 9 items regarding covid-19 infection transmission, covid-19 (vaccine recommendation, contraindication, effect, doses, etc....).

Scoring system: It consists of 9 items the correct answer was scored as 2 points and the incorrect answer was scored as 1 point. These scores were summed and converted into a percent score and classified into 2 categories:

- Satisfactory level of knowledge $\geq 75\%$.

- Unsatisfactory level of knowledge $<75\%$.

Part V: pregnant women's intention of the COVID-19 vaccination.

If the COVID-19 vaccine is made accessible, will you intend to be vaccinated? It was assumed that people who responded "Yes" to this question had positive intentions regarding vaccination, whereas those who responded "No" were assumed to have vaccine reluctance.

Scoring system for intention to take COVID 19 vaccine:

Intention to vaccinate against COVID-19 was measured based on one item ("How likely do you think you are to get a COVID-19 vaccine when one is available?").

Response options ranged from 1 = "very unlikely" to 5 = "very likely." It was dichotomized into "Intended to vaccinate" (if greater than or equal to mean score) and "not intended to vaccinate" (if less than mean score).

Validity

A panel of three specialists in the fields of maternity and neonatal health nursing evaluated the data collection tool and the substance of the educational guidelines. To check the clarity, applicability, and comprehensiveness of the questions. Recommended modifications were done accordingly, and the final form was modified.

Reliability of the data collection tools was tested using Cronbach's alpha coefficient which was (0.803) for pregnant women's knowledge regarding covid-19 vaccine questionnaire and (0.775) for pregnant women's intention to take covid-19 vaccine questionnaire which indicated that data collection tools had a good level of internal consistency.

Operational Design:

The operational design for this study included three phases preparatory phase, pilot study, and fieldwork.

Phase1: -Preparatory phase

The researchers reviewed related literature of the current study, national & international, using textbooks, articles, and scientific journals. This review was helpful to the researchers in reviewing and developing the data collection tools, and then the researchers made any needed modifications to the tools of data collection after their revising by Expertise

Phase11: A pilot study

It was carried out on 10% of the sample (20 pregnant women) for modification, clarification, and detection of any possible obstacles that might face the researcher and interfere with data collection. Unclear items were clarified, unnecessary items were omitted, and new items were added. Women from the pilot study were excluded from the study to avoid contamination of the main study population.

Phase111: Fieldwork:

The current study's data were collected over six months beginning in January 2022 and to the end in June 2022. The researchers went to the previously mentioned setting three times a week, from 9.00 a.m. to 12.00 p.m. The following phases were used to accomplish the aim of the study: the preparatory phase, interviewing & assessment phase, intervention, and evaluation phase.

1-Preparatory phase:

After obtaining official permits from all authorities, the researchers began reviewing relevant literature to design the study tool and program materials, and teaching methods.

2-Interviewing and assessment phase:

In which researchers interviewed and welcomed each participant in the waiting area to explain the purpose of the study and familiarize them with the nature and duration of the study before obtaining their approval to participate in the study. This phase lasted 5 minutes. Then the researchers assess the baseline socio-demographic, and obstetric data of the study participants' women and fulfill the pre-intervention assessment of women's

knowledge and acceptance towards Covid – 19 vaccines.

3-Intervention phase:

Following the collection of pre-test data, the researchers began implementing the pre-designed acceptance program

Program time: the program was implemented in theoretical sessions. These sessions were attended by nearly 15-20 participants' women. Total educational intervention time reached 96 hours / 16 weeks, with (6 hours /week-2 hours /daily) for all women while they were in the waiting room of El-fayoum university hospital.

Program objectives: this program implementing to equip and familiarize pregnant women with the essential information regarding covid – 19 vaccines.

Program materials: the content of the program covers the following topics: information needed about the COVID-19 vaccine such as benefits of the vaccine, side effects, contraindications, doses, preferable time of the first dose, and suitable type of vaccine recommended for pregnant women plus photos to clarify information. The sessions were performed by the researchers in the seminar room at obstetrics and gynecology department by using the Arabic language that is appropriate for women's understanding, the researchers firstly explored the false beliefs and misconceptions about the covid-19 vaccine, then explained the benefits of covid19 vaccine during pregnancy, mechanism of action and the latest recommendations regarding the safety of covid19 vaccine during pregnancy. Implemented through lectures, Photos, videos, and posters.

4-Evaluation phase:

After two months of program implementation, the researchers call each participant either in the clinic or remotely via phone, using the same pre-test study tool to complete the post-intervention test that evaluates the program's effectiveness.

Ethical consideration:

Before the research started, Approval from the Ethical Research Committee of the Faculty of fayoum University was obtained before conducting the study. The questionnaires included explanations about the purpose of the study and its consequences confirming the confidentiality of the data. women granted oral informed consent before data collection. To ensure anonymity, the completed tool was allocated a code number. The researchers informed the women that the information they had gathered would be kept private, and each woman had a right to withdraw at any time without giving a reason. In addition, women will not be harmed because of the research intervention.

Administrative Design

An official letter was done and obtained through an issued letter from the Dean of Faculty of Nursing fayoum University for data collection.

Statistical Analysis:

The collected data were analyzed using the statistical package for social sciences (SPSS 22.0) for descriptive statistics in the form of frequencies and percentages for categorical variables. Means and standard deviations were used for continuous variables. Chi-square tests (χ^2) were used for correlating categorical variables.

Limitations of the study:

The pregnant women were fearful of lack of safety, were unsure of vaccine effectiveness, fear of adverse effects, and mistrusted the safety of the vaccine during pregnancy.

Results:

Table (1) summarizes that three-quarters of studied women (75%) were aged between 26 and 30 years with Mean \pm SD (28.77 \pm 5.61). Regarding their residence, the majority of studied pregnant women (80%) were rural residents. According to studied pregnant women's education, half of them (50%) had secondary education. For their occupation,

about two-thirds of studied pregnant women (65%) were housewives.

Table (2) illustrates that more than two thirds of the studied pregnant women (70%) were primigravida. Regarding the studied pregnant women's gestational age, more than half of them (52%) were in the second trimester. For their antenatal care pattern, about two thirds of studied pregnant women (65%) had regular visits pattern.

Figure (1) shows that most of the studied women's sources of Covid 19 vaccine information were from the health team, and more than two-thirds of them their sources of information were from mass media.

Table (3) reveals that nearly three-quarters of studied pregnant women (72%) had incorrect answers before program implementation while most of them (89.5%) had correct answers after program implementation. Using the chi-square test, there was a statistically significant difference between studied pregnant women's knowledge pre and post-program implementation ($\chi^2 = 156.070$, $P = 0.001$).

Figure (2) illustrates that the majority of studied pregnant women (89.5%) had adequate knowledge about the Covid-19 vaccine after program implementation compared to before where the majority (72%) had inadequate knowledge. The difference in pregnant women's levels of knowledge about the COVID-19 vaccine through the program phases was statistically significant ($\chi^2 = 156.070$, $P = 0.000$).

Figure (3) illustrates that the majority of studied pregnant women (85%) who intended to take covid-19 vaccine post-program implementation were higher compared to preprogram (19%). The difference in pregnant women's intention to take covid-19 vaccine through program phases was statistically significant ($\chi^2 = 174.519$, $P = 0.001$).

Table (4) pinpoints that, before program implementation, the causes

reported by the women were fear of harming the fetus, fear of the unsafety of the vaccine during pregnancy, and fear of vaccine complications (37%, 32%, and 12%) respectively. While after program implementation, only 15% of pregnant women reported fear of the safety of the vaccine during pregnancy.

Table (5) depicts the relation between total knowledge and intention of studied pregnant women to take the covid19 vaccine in pre and post-program. There was a statistically significant relationship between pregnant women's total knowledge and their intention to take the Covid-19 vaccine.

Table (6) summarizes that before program implementation, there was a statistically significant relationship between pregnant women's knowledge and their age,

residence, and education, while the relation with occupation was non-significant. After program implementation, there were statistically significant relation between pregnant women's knowledge and their age ($\chi^2 = 33.360$, $P=0.001$), and education ($\chi^2 = 11.989$, $P=0.002$) while the relation with residence ($\chi^2 = 0.013$, $P=0.908$) and occupation ($\chi^2 = 2.625$, $P=0.105$) were non-significant.

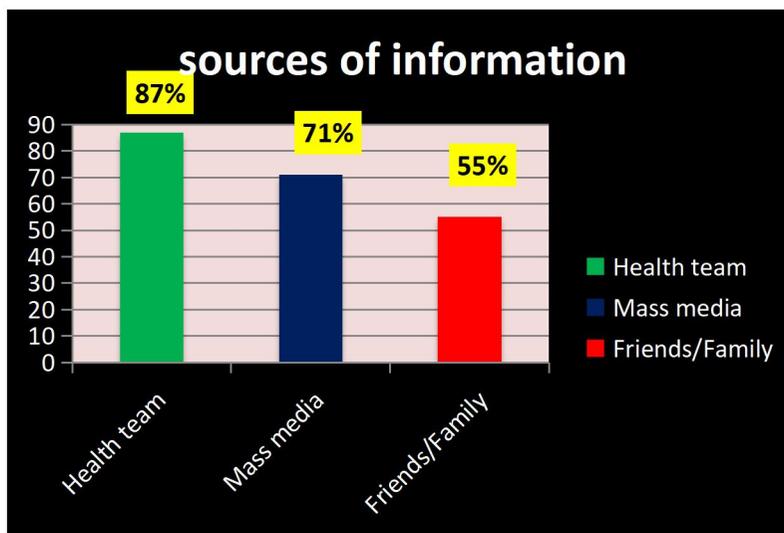
Table (7) reveals that before program implementation, the relations between socio-demographic characteristics and pregnant women's intention to take covid-19 vaccine were non-significant except for education. After program implementation, the relations between socio-demographic characteristics and pregnant women's intention to take covid-19 vaccine were non-significant except for age.

Table (1): Frequency Distribution of the studied pregnant women according to their socio-demographic characteristics ($N=200$).

Socio-Demographic Characteristics	N	%
Age		
– 18<25	30	15
– 26-30	150	75
– >30	20	10
Mean±SD	28.77±5.61	
Residence		
– Urban	40	20
– Rural	160	80
Educational level		
– Primary	60	30
– Secondary	100	50
– University	40	20
Occupation		
– Housewife	130	65
– Employed	70	35

Table (2) Frequency Distribution of the studied pregnant women regarding their obstetrical history ($N=200$).

Obstetrical History	N	%
Gravidity		
- Primigravida	140	70
- Multigravida	60	30
Gestational age		
- First trimester	30	15
- Second trimester	104	52
- Third trimester	66	33
Antenatal care pattern(visits)		
- Regular	130	65
- Irregular	70	35

Figure (1) Sources of information about Covid 19 vaccine ($N=200$).

*The responses are not mutually exclusive

Table (3): Frequency Distribution of studied pregnant women's knowledge about covid19 vaccine through program phases (N=200).

Knowledge Items	Pre				Post				χ^2	P-value
	Correct N	%	Incorrect N	%	Correct N	%	Incorrect N	%		
• COVID-19 vaccine is recommended for pregnant women.	53	26.5	147	73.5	183	91.5	17	8.5	174.659	0.001**
• Covid 19 vaccine doesn't interfere with pregnancy.	48	24	152	76	174	87	26	13	160.705	0.001**
• A vaccine can decrease the risk of Covid 19 transmission.	56	28	144	72	176	88	24	12	147.783	0.001**
• COVID-19 vaccine can severely affect my health condition during pregnancy.	57	28.5	143	71.5	182	91	18	9	162.426	0.001**
• Contraindications for covid19 vaccine in Pregnancy.	61	30.5	139	69.5	179	89.5	21	10.5	145.042	0.001**
• Number of doses of the covid 19 vaccine taken during pregnancy	72	36	128	64	175	87.5	25	12.5	112.291	0.001**
• Preferable time of the first dose of the covid 19 vaccine for pregnant women	68	34	132	66	178	89	22	11	127.758	0.001**
• Type of vaccine can pregnant women take	45	22.5	155	77.5	181	90.5	19	9.5	188.140	0.001**
• Care provided in case of (temperature of 38 degrees Celsius or higher	43	21.5	157	78.5	180	90	20	10	190.205	0.001**
Total knowledge	56	28	144	72	179	89.5	21	10.5	156.070	0.001**

** Significant difference at < 0.01 .

Figure (2): Frequency distribution of studied pregnant women's knowledge levels through program phases ($N=200$).

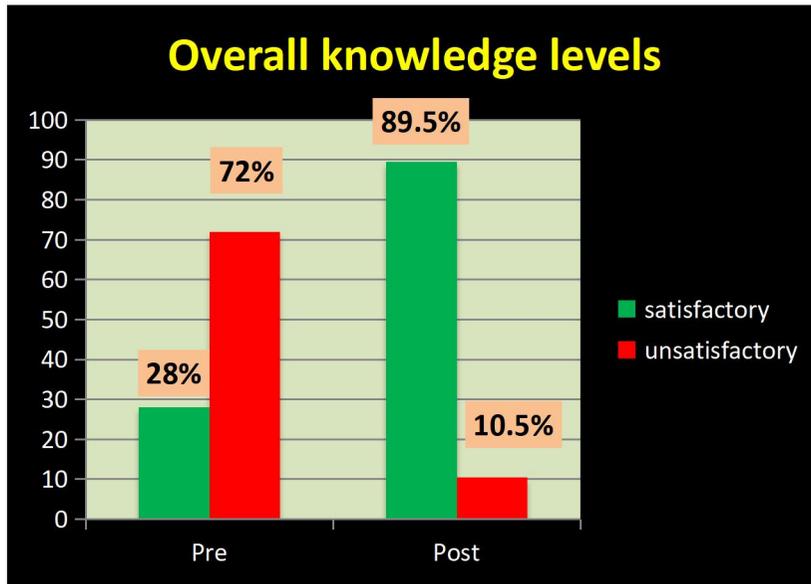


Figure (3): Frequency distribution of studied pregnant women's intention to take Covid-19 vaccine through program phases ($N=200$)

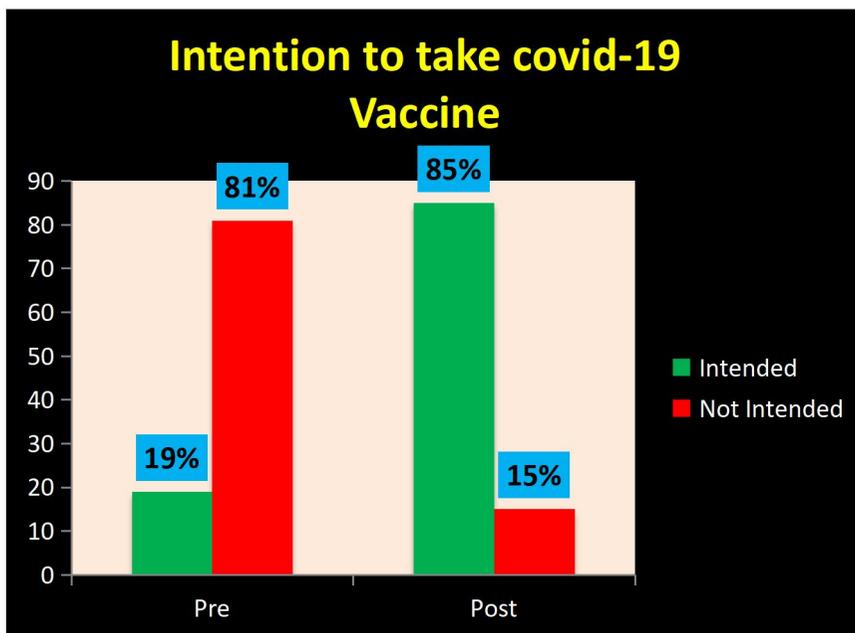


Table (4): Frequency Distribution of studied pregnant women according to their causes of not intending to take COVID19 (N= 200).

causes of not intending to take the Covid 19 vaccine	Pre		Post		χ^2	P-value
	N	%	N	%		
Fear of vaccine complications, and lack of trust.	24	12	0	0	25.532	0.001**
Fear of harming the fetus, and adverse effects.	74	37	0	0	90.798	0.001**
unsafety, and ineffectiveness of Covid 19 vaccine during pregnancy.	64	32	30	15	16.076	0.001**

** Significant difference at 0.01.

Table (5) Relationship between Total knowledge and Intention of studied pregnant women to take covid19 vaccine at pre and post-program (N=200).

Intention to take covid19 vaccine	Total knowledge				χ^2	P-value
	satisfactory		unsatisfactory			
	N	%	N	%		
Pre						
Intended	19	9.5	19	9.5	11.263	0.001**
Not Intended	37	18.5	125	62.5		
Post						
Intended	169	84.5	1	0.5	118.481	0.001**
Not Intended	10	5	20	10		

** Significant difference at 0.01.

Table (6) Relationship between demographic characteristics of studied pregnant women and their total knowledge pre and post Program (N=200).

Demographic characteristics	Total knowledge				χ^2	P-value	Post				χ^2	P-value
	Pre		unsatisfactory				Satisfactory		unsatisfactory			
	N	%	N	%			N	%	N	%		
Age (years)												
18<25	9	30.0	21	70.0	20.238	0.001**	18	60.0	12	40.0	33.360	0.001**
26-30	33	22.0	117	78.0			141	94.0	9	6.0		
>30	14	70.0	6	30.0			20	100.0	0	0.0		
Residence												
Urban	18	45.0	22	55.0	7.168	0.007**	36	90.0	4	10.0	0.013	0.908
Rural	38	23.8	122	76.3			143	89.4	17	10.6		
Educational level												
Primary	8	13.3	52	86.7	16.005	0.001**	47	78.3	13	21.7	11.989	0.002**
Secondary	28	28.0	72	72.0			93	93.0	7	7.0		
University	20	50.0	20	50.0			39	97.5	1	2.5		
Occupation												
Housewife	31	23.8	99	76.2	3.179	0.075	113	86.9	17	13.1	2.625	0.105
Employed	25	35.7	45	64.3			66	94.3	4	5.7		

** Significant difference at 0.01.

Table (7) Relation between demographic characteristics of studied pregnant women and their Intention to take Covid19 vaccine pre and post-program (N=200).

Demographic characteristics	The intention of pregnant women to take covid19 vaccine										χ^2	P-value
	Pre				χ^2	P-value	Post					
	Intended N	%	Not intended N	%			Intended N	%	Not intended N	%		
Age (years)												
18<25	8	26.7	22	73.3	1.451	0.484	18	60.0	12	40.0	17.307	0.001**
26-30	27	18.0	123	82.0			134	89.3	16	10.7		
>30	3	15.0	17	85.0			18	90.0	2	10.0		
Residence												
Urban	7	17.5	33	82.5	0.073	0.787	34	85.0	6	15.0	0.000	1.000
Rural	31	19.4	129	80.6			136	85.0	24	15.0		
Educational level												
Primary	5	8.3	55	91.7	54.624	0.001**	37	61.7	23	38.3	37.699	0.001**
Secondary	9	9.0	91	91.0			93	93.0	7	7.0		
University	24	60.0	16	40.0			40	100.0	0	0.0		
Occupation												
Housewife	24	18.5	106	81.5	0.070	0.791	108	83.1	22	16.9	1.077	0.299
Employed	14	20.0	56	80.0			62	88.6	8	11.4		

Discussion

The pregnancy period is a special time when susceptibility to morbidity and mortality for certain diseases increase. Considering the COVID-19 disease, it has been shown that pregnant women are more likely to show symptoms, be hospitalized in intensive care units, and need ventilators compared to non-pregnant women of the same age (Zambrano et al., 2020). For this reason, it is of practical value that vaccination, which is the most effective method of coping with the current pandemic, is recommended for the population of pregnant and lactating women. So, the *American College of Obstetricians and Gynecologists, 2020* recommends the COVID-19 vaccine be offered to all pregnant women but states that the decision should be left to the woman after careful consideration of individual risk factors.

The present study indicated that the two thirds of studied pregnant women were within the age range (26- 30 yrs.) with a mean age (28.77 ± 5.61) years. This result was supported by (Ayhan et al., 2021) who found that the mean age of the participant

in the study of COVID-19 vaccine acceptance in pregnant women was (27.99 ± 5.6). But this result was in contrast with (Skirrow et al., 2022) who found that the studied women's views on accepting COVID-19 vaccination during and after pregnancy with the most common age group 30-34 years.

The current study illustrated that half of the studied women had secondary education. This result was in the same line with (Ghamri et al., 2022), who conducted a study in Saudi Arabia about acceptance of the COVID-19 vaccine and associated factors among pregnant women and found that most studied women had secondary education. This might be because more educated people have better access to vaccine information and are also able to comprehend information regarding COVID-19 vaccine benefits and safety.

The present study indicated that more than two-thirds of the studied pregnant women were living in rural areas. This result was contraindicated with (Hailemariam et al., 2021) who stated that more than half of the participants are living in urban areas. A rural community might

oppose vaccination due to certain cultural values and they prefer natural immunity over-vaccination. So the researchers developed instructional guidelines to raise awareness and intention about COVID-19 vaccination.

The present study showed that most of the studied women's source of information regarding the COVID-19 vaccine was from health care providers, and more than two thirds of them their sources of information were from mass media. Healthcare providers are long-standing essential partners in the recommendation and safe administration of vaccines. Positive intention toward immunization in pregnant women is reported with the provider's recommendation for vaccination; they build confidence in patients who believe vaccinations are unsafe (**Lampsey, 2022**). Also, the regular visits pattern of pregnant women to the antenatal care unit increases their knowledge and intention regarding COVID-19 vaccination. This result was in contrast with (**Anikwe et al., 2020**), who revealed that more than half of the respondent's source of information was from mass media.

The current study revealed that more than one-third of Pregnant women thought that the vaccine has the possibility of harming their babies and about one-third of them were not sure about the safety of the vaccine during pregnancy and they were not intended to be vaccinated, which is consistent with the multinational study of (**Skjefte et al., 2021**) who found that the top reason for COVID-19 vaccine reluctance among pregnant women in 16 countries was the potentially harmful side effects for babies. Also, this study was supported by (**Ayhan et al., 2021**), who found that the most common refusal reasons of pregnant women for COVID-19 vaccination were lack of data about COVID-19 vaccine safety in pregnant populations and the possibility of harm to the fetus. This result may be due to the majority of the pregnant women being rural

residents and having a lack of knowledge regarding COVID-19 vaccine effectiveness and safety, impacts of the vaccination on pregnancy, fetal development, and later child wellbeing.

The present study illustrated that there was a highly statistically significant difference between pre and post-test regarding knowledge about COVID-19 vaccination. This result agreed with (**Simmons et al, 2022**), who illustrated that pregnant women had a lack of knowledge about the impacts of the vaccination on pregnancy, fetal development, and later child wellbeing. It appears that major educational efforts may be needed to help achieve high rates of vaccination. To improve coverage of the COVID-19 vaccine, pregnant women must have sufficient knowledge about its effectiveness and safety. So the health care professional had yet to offer consistent guidance on the COVID-19 vaccine.

The findings of the current study showed that there was a statistically significant difference between pre & post-test regarding the intention of studied pregnant women for the COVID-19 vaccine. This result was consistent with (**Riad et al., 2021**), who conducted a study about COVID-19 vaccine acceptance of pregnant and lactating women in Czechia and revealed that the overall COVID-19 vaccine acceptance level was substantially high (70.2%). The strongest predictors related to vaccine intention were lack of confidence in vaccine safety, effectiveness, fear of adverse effects, and mistrust of public health authorities. So, tackling the COVID-19 misconceptions is very crucial to improving vaccine uptake and ultimately attaining herd immunity.

The current illustrated that there was a statistically significant relationship between knowledge and intention toward COVID-19 vaccination post implementation of the instructional guideline. Correct information on the efficacy and safety of vaccinations for pregnant women and children can be

obtained through educational activities. During the COVID-19 epidemic, which may have impacted people's knowledge and views about vaccination, it is crucial to combat reluctance and dispel misconceptions. (Bruno, 2022).

The current study showed that there was a statistically significant relationship between pregnant women's knowledge and their age and education post-implementation. This result interprets that the instructional guideline may scale up the pregnant women's insight and awareness, which led to positive intention regarding COVID-19 vaccination and moreover was effective in positively changing knowledge and improving women's intention. This study result disagreed with (Reifferscheid et al., 2022), who stated that age and education are not significantly associated with vaccine acceptance, and vaccine safety concerns are almost universally reported as a barrier to vaccine uptake during pregnancy, for both routine and pandemic vaccinations.

Conclusion:

Based on the findings of the current study; the study concluded that implementation of instructional guidelines regarding COVID-19 vaccination showed a positive impact and effective improvement in pregnant women's knowledge and intention the conclusion of the current study supported the research questions and the aim of the study .

Recommendations:

- The health care providers should provide guidance, and reference materials concerning vaccination to the pregnant women.
- The health authorities should design interventions in terms of awareness campaigns via all types of multimedia to disseminate more transparent information about the safety and efficacy of the vaccines for pregnant women to boost COVID-19 vaccine acceptance.

- Change negative attitudes and improve acceptance and uptake of COVID-19 vaccines in Egypt through public health awareness campaigns.

Further research:

- Replication of the present study on a larger representative probability sample size in various Egypt governorates is recommended to achieve more generalization of the results.
- Further research should be conducted to evaluate the effect of counseling regarding covid19 vaccine on pregnant women's acceptance to take the vaccine and to develop an effective strategy to overcome vaccine hesitancy.

References:

- American College of Obstetricians and Gynecologists.** Vaccinating pregnant and lactating patients against COVID-19. Available at: <https://www.acog.org/clinical/clinical-guidance/practice-advisory/articles/2020/>.
- Anikwe C, Ogah C, Anilwe I, et al. (2020):** Coronavirus disease 2019: Knowledge, attitude, and practice of pregnant women in a tertiary hospital in Abakaliki, southeast Nigeria, international J Gynecol Obstet, 151, pp:197-202.
- Ayhan GS, Oluklu D, Atalay A, et al. COVID-19 vaccine acceptance in pregnant women.** Int J Gynaecol Obstet. 2021;154(2):291–296. doi:10.1002/ijgo.13713,
- Bruno S, Nachira L, Villani L, Beccia V, Di Pilla A, Pascucci D, Quaranta G, Carducci B, Spadea A, Damiani G, Lanzone A, Federico B and Laurenti P (2022)** Knowledge and beliefs about vaccination in pregnant women before and during the COVID-19 pandemic.

- Front. Public Health 10:903557. doi: 10.3389/fpubh.2022.903557
- Centers for Disease Control. New CDC data: COVID-19 vaccination safe for pregnant people; 2022.** Available from: <https://www.cdc.gov/media/>
- El-Elimat T, AbuAlSamen MM, Almomani BA, Al-Sawalha NA, Alali FQ (2021)** Acceptance and attitudes toward COVID-19 vaccines: A cross-sectional study from Jordan. *PLOS ONE* 16(4):e0250555. <https://doi.org/10.1371/journal.pone.0250555>.
- Fares, S., Elmnyer, M. M., Mohamed, S. S., & Elsayed, R. (2021).** COVID-19 Vaccination Perception and Attitude among Healthcare Workers in Egypt. *Journal of primary care & community health*, 12, 21501327211013303. <https://doi.org/10.1177/21501327211013303>
- Fisher K, Bloomstone S, Walder J., Crawford S., Fouayzi H., Mazor K.2020:** Attitudes Toward a Potential SARS-CoV-2 Vaccine: A Survey of U.S. Adults. *Ann. Intern. Med.* 2020 doi: 10.7326/M20-3569.
- Garg I, Shekhar R, Sheikh AB, et al.** COVID-19 vaccine in pregnant and lactating women: a review of existing evidence and practice guidelines. *Infect Dis Rep.* 2021;13(3):685–699. doi:10.3390/idr13030064
- Ghamri et al., Acceptance of COVID-19 Vaccine and Associated Factors Among Pregnant Women in Saudi Arabia,** patient Preference and Adherence 2022:16.
- Hailemariam S, Mekonnen B, Shifera N, Endalkachew B, Asnake M, Assefa A, Qanche Q. (2019):** Predictors of pregnant women's intention to vaccinate against coronavirus disease. A facility-based cross-sectional study in southwest Ethiopia. *SAGE Open Med.* 2021 Aug 19;9:20503121211038454. doi: 10.1177/20503121211038454. PMID: 34434555; PMCID: PMC8381422.
- Januszek, S.M.; Faryniak-Zuzak, A.; Barna's, E.; Łoziński, T.; Góra, T.; Siwiec, N.; Szczerba, P.; Januszek, R.; Kluz, T.(2021).** The Approach of Pregnant Women to Vaccination Based on a COVID-19 Systematic Review. *Medicina*, 57, 977. <https://doi.org/10.3390/>
- Jayagobi P, Ong C, Thai Y, Lim C, Jiun S, Koon K, Wai K, Chan J, Mathur M& Chien C.(2021):** Perceptions and acceptance of COVID-19 vaccine among pregnant and lactating women in Singapore: A cross-sectional study. *medRxiv* L.06.29.21259741; doi: <https://doi.org/10.1101/2021.06.29.21259741>
- Lampthey E, (2022):** Overcoming barriers to COVID-19 vaccination of pregnant women. Institute of Life and Earth Sciences (Including Health and Agriculture), Pan African University, University of Ibadan, Ibadan, Nigeria. Volume 2, Issue 1, March 2022, Pages 29-33. www.keaipublishing.com/en/journals/gynecology-and-obstetrics-clinical-medicine.
- Lazarus JV, Ratzan SC, Palayew A, Gostin LO, Larson HJ, Rabin K, Kimball S, El-Mohandes A.** A global survey of potential acceptance of a COVID-19 vaccine. *Nature medicine.* 2020 Oct 20: 1-4.
- Omar DI, Hani BM.** Attitudes and intentions towards COVID-19 vaccines and associated factors among Egyptian adults. *J Infect Public Health.* 2021 Oct;14(10):1481-1488. doi: 10.1016/j.jiph.2021.06.019. Epub 2021 Jul 3. PMID: 34247946; PMCID: PMC8253692.
- Reifferscheid L, Marfo E, Assi A, Dubé E, MacDonald NE, Meyer SB, Bettinger JA, Driedger SM, Robinson**

- J, Sadarangani M, Wilson SE, Benzies K, Lemaire-Paquette S, Gagneur A, MacDonald SE. COVID-19 vaccine uptake and intention during pregnancy in Canada. *Can J Public Health*. 2022 Aug;113(4):547-558. doi: 10.17269/s41997-022-00641-9. Epub 2022 Apr 27. PMID: 35476258; PMCID: PMC9045023.
- Reiter P., Pennell M., Katz M. **Acceptability of a COVID-19 vaccine among adults in the United States: How many people would get vaccinated?** *Vaccine*. 2020;38:6500–6507. doi: 10.1016/j.vaccine.2020.08.043. releases/2021/s0811-vaccine-safe-pregnant.html. Accessed March 9, 2022.
- Simmons, L. A., Whipps, M. D., Phipps, J. E., Satish, N. S., & Swamy, G. K. (2022). Understanding COVID-19 vaccine uptake during pregnancy: ‘Hesitance’, knowledge, and evidence-based decision-making. *Vaccine*, 40(19), 2755-2760.
- Skirrow *et al.* *BMC Pregnancy and Childbirth* (2021) 22:33 <https://doi.org/10.1186/s12884-021-04321-3>.
- Skjefte M, Ngirbabul M, Akeju O, Escudero D, Hernandez-Diaz S, Wyszynski DF, et al. COVID-19 vaccine acceptance among pregnant women and mothers of young children: results of a survey in 16 countries. *Eur J Epidemiol*. 2021;36:197–211.
- Sutton D, D'Alton M, Zhang Y, et al.(2021): COVID-19 vaccine acceptance among pregnant, breastfeeding, and nonpregnant reproductive-aged women. *Am J Obstet Gynecol MFM*
- Thompson.S.k. (2012). sampling. Third edition. John Wiley & sons(vol,755). P:59-60, ISBN:978-0-470-40231-3.
- United Nations Population Fund.(2020):Reproductive, maternal, newborn and adolescent health during pandemics. United Nations Population Fund;2020.<https://reliefweb.int/sites/reliefweb>
- World Health Organization (WHO)(2020): Clinical management of severe acute respiratory infection when novel coronavirus(nCoV)infection is suspected: interim guidance. www.who.int/docs/default-source/coronaviruse/clinical-management-of-novel-cov.pdf.Published January 12, 2020.
- World Health Organization (WHO), (2022): WHO Coronavirus (COVID-19) Dashboard.Egyptian situation, Confirmed cases and deaths. Available at <https://covid19.who.int/region/emro/country/eg>.
- Zambrano, L.D.; Ellington, S.; Strid, P.; Galang, R.R.; Oduyebo, T.; Tong, V.T.; Woodworth, K.R.; Nahabedian, J.F.; Azziz-Baumgartner, E.; Gilboa, S.M.; et al. Update: Characteristics of Symptomatic Women of Reproductive Age with Laboratory-Confirmed SARS-CoV-2 Infection by Pregnancy Status—United States, January 22–October 3, 2021. *MMWR Morb. Mortal. Wkly. Rep.* 2021, 69, 1641–1647. [CrossRef] [PubMed].
- Zewude B, Melese B, Habtegiorgis T, Tadele M, Solomon W. *Front Public Health*. 2021 Aug 6;9:716814.doi:10.3389/fpubh. 2021.