Health Awareness Program to Pregnant Women Regarding Corona virus Disease (Covid 19)

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Abstract

Background: Corona virus disease (COVID-19) was newly discovered, and it is a contagious disease, and it is accompanied by a mild to moderate respiratory disease t without the need for treatment. Critical principles must be followed to ensure the well-being and safety of pregnant women by increasing the awareness of pregnant women about the disease Corona Virus (COVID-19). **Aim:** This study aimed to evaluate the effect of the health awareness program on pregnant women with regard to Coronavirus disease (COVID 19) **Design**: A quasi -experimental design was used in the current study **Setting.** The present study was conducted among pregnant women in antenatal outpatient clinics in maternity and gynecological hospital affiliated to Ain Shams University **Sample**: A purposive sample **Size:** 200 pregnant women attending the previous study sitting in outpatient clinic during the time of data collection and fulfilled the study inclusion criteria. **Tools**: four tools were used for data collection: **1-** Structured interviewing questionnaire sheet included three parts: Part 1- women personnel characteristics. Part 2- women past and present obstetrical & medical history. Part 3- Assessment knowledge of pregnant women regarding Coronavirus disease (COVID 19).**2-** Pregnant women's attitude towards coronavirus.**3-** Evaluate of Pregnant women practices regarding precautionary measures regarding protection of (COVID 19). **4-** Pregnant women 'satisfaction regarding Corona virus (COVID 19) awareness programs Questionnaire. **Results**: The current study detects that highly statistically significant difference (p< 0.001) of studied pregnant women' knowledge, reported practice before awareness program, and after awareness program immediately and after one month of awareness program. Addendum for that the studied women point out high pleasure and satisfaction level concerning the health awareness program**.** Also, this study demonstrates that there was correlation between knowledge and attitude among studied women regarding (COVID 19) and also reveals that there was highly statistically significance different (p< 0.001) amongst studied women' knowledge and attitude. As More than two third of studied women before health awareness program had negative attitude likewise had inadequate knowledge compared to after health awareness program **Conclusion:** Based on current research finding, the existing study reinforced the study hypothesis, our study exhibited that awareness program certainly affects studied women' practices, knowledge and attitudes concerning Covid 19. **Recommendations:** Heath awareness program regarding Corona virus (COVID 19) should be conducted at all antenatal outpatient clinic setting for all pregnant women, in different setting area.

Keywords: Awareness, Corona virus, (Covid 19) Heath, Program, Pregnant, Women.

Introduction

Novel COVID-19 is a new respiratory infection *(Englund and Chu, 2018)* that started in China, Wuhan, and has spread rapidly throughout the world, so the World Health Organization has called it the "pandemic of the century." (*WHO, 2020).* Patients with Coronavirus disease COVID-19 will face the common cold and acute respiratory failure. However, there is no specific drug still available to prevent or treat this disease, and the only ways to protect people from this infection are preventive measures. *(WHO,2020)*. This is likely to be the most dangerous group for infection with the new coronavirus. Women who are pregnant or recently pregnant, the elderly, those are overweight, and those with pre-existing medical conditions such as high blood pressure and diabetes. Corona virus disease (COVID-19) was newly discovered, and it is a contagious disease, and it is accompanied by a mild to moderate respiratory disease that does not need treatment.   Coronavirus disease (COVID-19) is transmitted quickly through

dealing and contacting an infected person, and this method is not the only way to transmit it. One of the signs of infection with the Corona virus is fever, in addition to a dry cough, accompanied by fatigue and muscle pain, and sometimes in some people shortness of breath, runny nose and sneezing and sore throat, *(Shereen et al., 2020).*

Infectious diseases caused by microorganisms that cause diseases such as viruses, bacteria, and fungi, and may be transmitted directly or indirectly, and some of them are harmful and some of them may be harmless and preventable. The most vulnerable patients to infection are pregnant women *(Jamieson et al.,2006)* prenatal respiratory infections lead to stillbirth, possibly miscarriage, and premature birth. A set of preventive measures recommended by the World Health Organization include washing hands daily with soap and water, rubbing alcohol, covering mouth and nose when coughing, and social distancing, according to the American College of Obstetricians and Gynecologists. The World Health Organization also recommended the need to take the necessary safety measures and interventions to reduce the possibility of infection with Coronavirus (Covid-19) and the spread of the disease from one region to another. Since Coronavirus disease (COVID-19) is highly contagious and leads to many deaths in the world, there is currently no antiviral treatment, so the most important measure is to implement preventive measures to deal with transmission of coronavirus disease (COVID-19) through increased health awareness (**WHO, 2020**)

Women are exposed to viral infections in the respiratory system, because pregnancy is a physiological condition and causes physiological changes in the immune system, heart and lung. Therefore, the spread of infection to household contacts should be prevented by educating pregnant women and family members about personal hygiene, basic infection prevention and control measures, and how to care as safely as possible for a person suspected of having (COVID-19). *(WHO,2020)*

The consequences of (COVID-19) for pregnant women in the focus of a speedily developing outbreak that possibly will have noteworthy properties on community health and medicinal substructure, the only necessity of pregnant women would be encompassed in readiness and response plans. It is dangerous that pregnant women are deprived of possibly lifesaving interferences in the situation of a serious communicable disease. As beside wholly decisions concerning treatment through pregnancy, cautiously weighing of the benefits of interferences for the women and fetus through possible risks is necessary *(Sonja, et al, 2020).* Individual's awareness concerning corona virous are influenced through commitment to these preventive and control measures, depending on health behavior changing *Hoda J. (2016).* Wherever in this human behavior change included three sequent topics, specifically, the right knowledge gaining, attitudes generating and practice adopting *(Fan et al.,2020).* According to *(Maharlouei N, et al. 2020),* who have explicated that the personal level of awareness is accompanied with more efficient care management and prevention of the disease and human's health promotion, for the reason that insufficiency personal level of awareness is corresponding to poor health and inappropriate behavior for communicable disease prevention

A knowledge, attitude and practice survey are a suitable way to evaluate existing program and to identify effective strategies for behavioral change in society. The pivotal role of nurses is actually undeniable. community health nurses not only provide definitive patients necessity care, but they render as agents role of advocation, alteration for patients and enhancing improvements toward health systems *(Abdelhaz, A.Z. et al, 2020).* Community health nurses are crucial portion of the health manpower, and have a variety role, inclusive provision of community services linking with health facilities, community empowerment. Their roles are superior in the scope of maternal and communicable diseases. Over and above that, as communities combat with COVID-19 pandemic, they oftentimes depend on community health nurses for care, emotional support, and information *(Stirling, et al 2017).*

Significance of the study:

In February 2021, the World Health Organization **(WHO)** registered more than 111 million confirmed cases across **223** countries and territories, with more than two million and 475.020 confirmed deaths **(WHO, 2020).** Moreover, the **Ministry of Health and Population Egypt (MOHP),** on February 23, 2020, Egypt had 179,407 confirmed COVID-19 cases and 10,443 deaths **(MOHP, 2020).**

Actually, in Egypt coronavirus covid 19 is looking pandemic as portion of persistent widespread worldwide, consequently that, there is a mandatory need to promote pregnant women awareness concerning corona virous. Furthermore, knowledge evaluation of pregnant women is significant to gaps determine, strengthening and weakness for facilitating management of COVID-19outbreak and decreased efforts in Egypt controlling the transmission of COVID-19 amongst the pregnant women.

Pregnant women need extra precautions to avoid contracting COVID-19. They are more likely to get seriously ill from COVID-19 than non-pregnant people. There are concerns about adverse maternal and perinatal outcomes due to characteristic immunosuppression during pregnancy. Pregnant women with COVID-19 are at increased risk of adverse pregnancy outcomes such as premature birth *(CDC, 2019).* Over the course of about six months, the CDC received more than 325,000 reports of women age 15 to 44 who had tested positive for SARS-CoV-2, the virus that causes COVID-19. Of those, more than 8,200 were pregnant. 90% of infected pregnant women recover without hospitalization and rapid clinical deterioration is possible **(CDC,2020).**

There is an urgent need to recognize the pregnant women's COVID-19 awareness during this challenging time. Knowledge and attitudes concerning communicable diseases are often connected with the panic level among the pregnant women, which could additional complicate the measures which taken to avoid the spread of COVID-19.Thus increasing awareness among pregnant women regarding handling highly contagious respiratory diseases such as the emerging corona virus very important and plays an imperative role in reducing disease and preventing its spread therefore, an awareness program for pregnant women was designed to prevent the emerging corona virus *(Bhardwaj, 2020).*There are, however, no a lots of studies about the effect of awareness program on pregnant women' regarding COVID-19 in Egypt. Therefore, the current study signifies the effect of awareness program concerning COVID -19 conducted in pregnant women.

Aim of the Study:

This study aimed to evaluate the effect of the health awareness program on pregnant women with regard to Coronavirus disease (COVID-19), and this goal was achieved through the following:

1- Assessment of pregnant women's knowledge, attitude & practice regarding Coronavirus disease (Covid 19) before implementing the Health Awareness program

2- implementing standardized Health Awareness program

3- Evaluating effect of the Health Awareness program on pregnant women's knowledge, attitudes & practice regarding (Covid 19) after implementing the Health Awareness program

4- Assess pregnant women 'satisfaction regarding Corona virus (COVID 19) awareness programs

Research Hypothesis:

Health awareness program will improve pregnant women' knowledge, attitudes and practice regarding Coronavirus disease (Covid 19).

Subjects and Methods Research design

In the current study, A quasi - experimental design was used

Setting:

The present study was conducted at antenatal outpatient clinics in maternity and gynecological hospital affiliated to Ain Shams University. the maternity and gynecological hospital divided into two buildings one for inpatient, labor, operating room, intensive care units and another building for outpatient clinics.

The researchers choose this setting because it is university hospital, so the researcher expect to meet large number of the study sample

Sampling type:

A purposive sample including200 pregnant woman

Sample size:

Consists of 200 women attending the previous study sitting in antenatal outpatient clinic during the time of data collection and fulfilled the study inclusion criteria, collect the sample size, calculated based on a power analysis of 0.95 (β=1-0.95=0.5) at alpha .05 (One – Sided) with large effect size (0.5) was used as the significance. The sample was allocated to the following criteria:

Inclusion criteria: pregnant women, who attending to the antenatal outpatient clinic without complications and agree to share in the study, primiparous and multiparous women, regardless of the maternal age.

Tools of the study: four tools were used for data collection:

1- **Structured interviewing questionnaire:** It was developed by the researchers after review of related literature (**W HO, 2020), (CDC, 2020)** written in a simple Arabic language for data collection were used in the research and it covered the demographic characteristics, women past and present obstetrical & medical history and knowledge toward Coronavirus disease COVID-19 and included three parts.

Part one: It included socio demographic data including age, educational level, residence, occupation, social level.

Part two: Women past and present obstetrical & medical history, such as parity, number of births, duration of pregnancy, Anti natal care regulatory and chronic disease history such as, hypertension, diabetes, renal disease.

Part three: Assessment knowledge of pregnant women regarding Coronavirus disease COVID-19 such as information about the Corona virus, definition, signs and symptoms, risk factors and mode of transmission,

Protective measures, early detection of corona virus, how to prevent exposure to infection with the Corona virus, it was encompassed 15 questions, this questionnaire part was established subsequent of literatures review (**WHO,2020) & (CDC ,2020)**.

Scoring system:

A correct answer was assigned 2 points and an incorrect answer was assigned 1 point. The total knowledge score was ranged from 1 to 30, with high scores indicating adequate knowledge about COVID-19. >75% of total knowledge score (23-30). The average knowledge about COVID-19, 50% - 75% of total knowledge score (15-22) and the inadequate knowledge about COVID-19< 50% of total knowledge score (1-14).

2- Pregnant women's Attitude towards corona Questionnaire. This questionnaire was developed by the researchers after reviewing the literature (*Zhong et al., 2020)*. It was used to assess pregnant women's attitude toward Coronavirus disease Covid 19 - It consist of 18 statements.

Scoring system:

Attitude toward COVID -19. It contains 18 statements; in the section on attitudes, scores were calculated based on the respondents' answers to each attitudinal statement, 1 = disagree, 2 = indifferent and 3 = agree. Scores were calculated by averaging respondents' answers to the 18 statements. Total scores ranged from 18 to 54, with high scores indicating positive attitudes, indicating internal reliability. The total scores of pregnant women's attitude was divided into two levels; A score above (≥ 70 %) considered positive attitude. A score of less than 70% was considered negative attitude.

3- Evaluate of Pregnant women practices regarding precautionary measures regarding protection of COVID 19. It was adopted from (**CDC ,2020**) & (**WHO,2020**). Recommendation's literatures of precautionary measures to prohibit infection transmission of COVID-19 from human-to-human. The practice questionnaire included 10 topics each topic contents some items: (1) Hand washing topic consists of 12 items involved of routine hand washing practice. (2) Social distance topic according to

recommendation of WHO which consists of 5 items involving, keep of at least 1 meter between the others, avoidance of crowded areas, isolation if having trivial symptoms as headache, sneeze, and cough, keep away from individuals who has trivial symptoms and avoidance of close contact with sick people and keeps physical distancing. (3) Coughing technique consists of 4 items involving, put the paper handkerchief on the nose when sneezing or coughing, immediately dispose it and clean hands. Avoidance touching of, face, nose, eyes, and mouth. (4). Avoid touching the nose, mouth, face, and eyes of one item. (5) Safely consume medical and a non-medical mask or face shielding topic consists of 5 items involving wearing, take off and get rid of the mask techniques, moments of wearing mask and rate of recurrence for wearing mask each day. (6) Maintain environmental cleaning and disinfection topic consists of 4 items involving, maintain calm down-home environment and diminish stressful situations, maintain environmental home clean, maintain good environmental home ventilation, clean all surface with soup and water then use antiseptic solution. (7) Maintain good nutrition topic consists of 4 items involving, Boost consumption of vitamins and fluids enhance intake of food valuable in iron, protein, and calcium. Reduce intake of salty foods and fat. Reduction of confine and chocolate intake. (8) Maintain good rest and sleep pattern topic consists of 3 items involving, improve routine a restful bedtime, maintain a consistent bedtime and wake time, and restrict any breathing problems. (9) Vitamin supplementation maintenance topic consists of 2 items involving, the intake of, calcium, iron, and vitamin D. The vitamin supplementation being as recommended by the Physician. (10) Regular follow up topic consists of 2 items involving, being present at times of antenatal care visits, and don't be unwilling to seek examination consideration in case of having trivial signs as sneeze, cough, and fever.

Scoring system:

For all practice item when the studied pregnant women were performed practice item usually the practice questionnaire scored (3), for performed practice item occasionally the practice scored was (2), and for performed practice item rarely the practice scored was (1), the total items score were (123), the total practice score was categorized as the following acceptable practice >60% of total practice score (74-123 score), unacceptable practice <60% of total practice score (<73 score).

4- Pregnant women' satisfaction regarding Corona virus COVID 19 awareness programs Questionnaire was used to assess pregnant women 'satisfaction regarding Corona virus COVID 19 it consists of (8) statement. The pregnant women should be choosing one answer from the following (strongly agree, agree, indifferent, disagree and strongly disagree).

Content validity

Tools of data gathering were proposed to a panel of 3 nursing experts in the field community health, 3 nursing experts the field of Obstetrics and Gynecology & 2 medical expertise in the field of Obstetrics and Gynecology and community health to test the content validity. The outcome of content validity index described powerfully accepting tools, it measured (0.89). In adding, the content of awareness program educational guideline was revised by the panel of the same expertise and its contents were revised censoriously and validated.

Reliability

The reliability was performed by Cronbach's Alpha test which discovered that each of the four tools involved of fairly homogenous items as showed by the high reliability of all tools, it was (0.94) for knowledge tool, (0.93) for attitude tool and (0.89) for practice tools. The Likert scales were assessed for internal reliability, using Cronbach's α. Cronbach's alpha coefficient was 0.81

Ethical Considerations

Permission was obtained from the director of the Obstetrics and Gynecology Hospital, Ain Shams University, to enable the data gathering process. Written informed consent was obtained from the studied pregnant women before information gathering and after the aim of the research was clarified. The researchers

conversant the studied pregnant women that the data gained would be confidential. The studied pregnant women were conversant of their free to withdraw at any period. The pregnant women were assured that their participation was volubility, and they have the right to participate or not and this does not affect the services will receive.

A Pilot Study:

The pilot study was carried out on 20 pregnant women, which was taken in 10 % of the total sample. It is primarily established to examination of the applicability, clarity, and simplicity, determine the significance and content validity of the tools, as well as assessment of tools required time. Conferring to the outcomes of the pilot study, the tools were relevant, applicable, valid, and clear; however, limited words were changed, and no problematic affected with the procedure of data gathering. The time required to fill the information gathering tools was estimated 15 minutes. Resulting of this pilot study, the tools were completed prepared for usage. Pregnant women involved in the pilot excluded the study.

Field work

Data of the present study was gathered during a period of five months from the beginning of April 2021 and finalized at the end of August 2021. The researchers stayed the previously mentioned setting 4days/week, from 9.30 am to 12.30 pm. The following phases of Preparatory, interviewing & assessment, planning, implementation of the health awareness intervention and evaluation were assumed to achieve the purpose of this study.

1-Preparatory phase:

The researchers directed this phase over revising international interrelated literature regarding the numerous aspects of the study problem. This phase facilitated the researchers to be aware with the significance of the problem.

2-Interviewing and assessment phase:

The researchers attended at Maternity Hospital-Ain Shams University antenatal outpatient clinic. 4 days per week from 9.30 am to 12.30 pm. Pregnant women were grouped in the waiting area of outpatient clinic. At the first of the interview, the researchers greeted the pregnant women, the researchers introduced themselves to pregnant women, clarified the aim of the study and its implications on the clinical field, and ensures their cooperation then oral consent of women were gained. The researchers started to fill the interview questionnaire sheet to assess study sample personnel characteristics to maintain confidentiality of the study sample, assessment knowledge, practice and attitude as pre-assessment. a total (5-7) women were interviewed daily. The data obtained during this phase were constituted the base line for further comparison to evaluate the effect of the awareness program after implementation.

3-Planning phase:

Based on outcomes gained from assessment phase, the health awareness program was adopted from WHO in a form of printed Arabic booklet to enhance the studied pregnant women's knowledge, practice, and attitude concerning COVID -19. Diverse approaches of teaching, and instructional means alike audiovisual & demonstration were used to explicate guideline to studied pregnant women. Health awareness program's Objectives were created and encompassed the following: General objectives to prepare the studied pregnant women with the important essential knowledge and protective procedures practice concerning COVID -19. Specific objectives to acquaint the studied pregnant women with plenteous knowledge and protective procedures practice regarding COVID -19. The schedule for session were average according to women attended visits.

4- Implementation of the health awareness program phase.

The health awareness guideline was offered for the studied women through two diverse sessions. one theoretic session was performed in about 15 minutes, and researchers provided consideration that all studied women follow protective procedures, as keep social distance and wearing mask to avoid COVID 19 infection. This session was contained awareness about COVID -19 and protective procedures, such as explanation of covid -19 definition, complications, causes, signs &

symptoms, and the effect of COVID -19 infection for pregnant women and her fetus. It was applied through power point presentations using videos and posters.

The second session was practical session it takes about 30 minutes. The researchers instructed pregnant women the procedures of hand washing, wearing, and removing of the mask. It was applied through power point presentations, educational films, demonstration and redemonstration. Total educational involvement time reached 96 hours for 8 weeks for all studied pregnant women, with 12 hours per week – 45 mints per daily. Women' inquiries were discussed at the termination of all session, to right any misinterpretation.

5- Evaluation phase:

The evaluation was done immediately after implementation of health awareness program among the studied women consuming the identical format of tools that utilize to estimate knowledge, practice, and attitude in the pre-test, each studied pregnant women was telephoned to assure presence the following antenatal appointment that is afterward one month form first evaluation of awareness program. Evaluation of pregnant women satisfaction regarding awareness program was done after one month from the program.

Limitation of the study

Fifteen women were excluded from the study sample as 6 refuse to share because they believed that everything come from Allah, so the precautions are useless and another 9 studied women do not attend follow up. The cases excluded from the study were compensated with another 15 cases to supplement the sample studying of research

III- Statistical Design:

The IBM SPSS statistical software version 22 was consumed for Data analysis. Descriptive statistics was utilized frequency for categorical variables, and for constant variables [mean and standard deviation (SD)]. Qualitative variables were associated utilizing qui square test (X2) as the test of significance. Correlation coefficient (r) Pearson was utilized to estimate association between studied

variables. A significant level value was considered when p-value ≤ 0.05

Results

Table (1) displays the Percentage distribution of personnel features of the studied women. Conferring studied women' age, it was observed that above the half (58.5%) of them their age ranges from 25< 30yrs with the mean age ± SD   28.72±9.28 years. Concerning studied women' education it is noticeable that less than half of the studied women (46.5.0%) had Secondary education. As regard studied women' residence, it was detected that less than three quarter of them (74.0%) were living in urban areas. Moreover, 82.5% of them was housewife.

Table (2): Shows the percentage distribution of obstetrical & medical history of the studied women. Regarding studied women' parity, more half of them were primigravida. Concerning studied women' antenatal attendance care visits it is noticeable that more two third of them (67.5%) were attended regularly.

Table (3): Illustrates that the studied women' knowledge regarding Corona virus COVID 19 before program, after program immediately and after one month of program have highly statistically significant difference (p< 0.001).

Figure (1): Proves the percentage distribution of studied women' total knowledge score regarding Corona virus COVID 19. Concerning studied women' adequate knowledge it is noticeable that more than three quarter of the studied women (78 %) were have adequate knowledge after awareness program, and 74% after one month of program with compared to 8.5% before awareness program.

Table (4): Demonstrates percentage distribution of studied women' reported practice regarding COVID 19' protective measures and reveals that highly statistically significant difference (p< 0.001) of studied women' reported practice before program, after program immediately and after one month of program.

Figure (2): Determines percentage distribution of studied women' reported total

practice regarding Corona virus COVID 19 protective measures, it is obvious that majority (81 %) of the studied women, were have accurately reported total practice after awareness program, and (75%) after one month of program with compared to (29.2%) before awareness program.

Table (5): Shows percentage distribution of studied women' attitude regarding COVID 19 and exposes that highly statistically significant difference (p< 0.001) of studied women' attitude before program, after program immediately and after one month of program.

Figure (3): Illustrates percentage distribution of studied women' total attitude regarding Corona virus COVID 19 it is clear that less than three quarter (70.5 %) of the studied women, were have positive attitude after awareness program, and (69.0%) after one month of program with compared to (14%) before awareness program.

Table (6): Demonstrates Correlation between knowledge and attitude among studied women regarding Corona virus COVID 19 and reveals that highly statistically significance different (p< 0.001) amongst studied women' knowledge and attitude. As More than two third (65%) of studied women before health awareness program had negative attitude likewise had inadequate knowledge compared to (67.5%) after health awareness program and (64%) after one month of program had positive attitude likewise had adequate knowledge.

Table (7): Emphasis correlation between knowledge and practice among *studied women* regarding *Corona virus* COVID 19 and

exposes that highly statistically significance different (p< 0.001) amongst *studied women'* knowledge and practice. Less than two third (61.5%) of *studied women* before health awareness program had unacceptable practice likewise had inadequate knowledge compared to (71%) after health awareness program and (69%) after one month of program had acceptable practice likewise had adequate knowledge.

Table (8): Proves distribution of studied women 'satisfaction regarding Corona virus COVID 19 awareness program and it was demonstrated that the studied women' satisfaction is noticeable as the majority (98.5%) were conveyed the **strongly agree** of the program covered all inquiry to prevent covid infection, teaching materials used in this program has been useful for improving them practices, also (99.5%) conveyed the **strongly agree** of the program was implemented in easy and useful language.

Table (1): Percentage distribution of demographic characteristics of the studied women (n=200)

Items	No	%
Age		
19 years	5	2.5%
20: <30	117	58.5%
30: ≤40	78	39%
Mean ± SD (years)	28.72±9.28	
Educational status		
No formal education	27	13.5%
Primary	56	28%
Secondary	93	46.5%
College and above	24	12%
Residence		
Urban	148	74%
Rural	52	26%
Occupation		

Items	No	%
Employee	*35*	*17.5%*
Housewife	*165*	*82.5%*
Status of monthly expenditure and income		
Hardly enough	*30*	*15%*
Enough	*10*	*5%*
Not enough	*160*	*80%*

Table (2): Percentage distribution of obstetrical & medical history of the studied women (n=200)

Items	No	%
Parity		
Primigravida	115	57.5%
Multipara	62	31%
Grand multipara	23	11.5
Numbers of childbirth		
Non	115	57.5%
1-2	65	32.5%
>-3	20	10%
Chronic disease		
Not present	158	79%
Cardiovascular	2	1%
Endocrine	3	1.5%
Diabetes mellitus	14	7%
Kidney	2	1%
Respiratory	4	2%
Hypertension	17	8.5%
Antenatal care		
Regular visited antenatal care	135	67.5%
Irregular visited antenatal care	65	32.5%

Table (3): Percentage distribution of studied women' knowledge regarding Corona virus COVID 19 (n=200)

Items	Before program				After program immediately				After one month of program				X2	P value
	Correct answer		Incorrect answer		Correct answer		Incorrect answer		Correct answer		Incorrect answer			
	No	%	No	%	No	%	No	%	N	%	N	%		
Corona virus COVID 19' definition	95	47.5%	105	52.5%	167	83.5%	33	16.5%	160	80%	40	20%	25.70	<0.001
COVID 19' symptom	88	44%	112	56%	174	87%	26	13%	167	83.5%	33	16.5%	28.5	<0.001
COVID 19' diagnoses methods	93	46.6%	107	53.4%	160	80%	40	20%	142	71%	58	29%	20.7	<0.001
COVID 19 transmission routes	103	51.5%	97	48.5%	167	83.5%	33	16.5%	134	67%	66	33%	13.05	<0.001
COVID 19 infection risk Factors	96	48%	104	52%	142	71%	58	29%	142	71%	58	29%	28.43	<0.001
COVID 19 incubation period	55	27.5%	145	72.5%	166	83%	44	22%	160	80%	40	20%	39.03	<0.001
COVID 19 isolation period	42	21%	158	79%	175	87.5%	25	12.5%	168	84%	42	21%	15.8	<0.001
The difference between isolation and quarantine	68	34%	132	66%	168	84%	42	21%	167	83.5%	33	16.5%	45.21	<0.001
The impact of infection with the COVID 19 on the health of a pregnant women and fetus	93	46.6%	107	53.4%	160	80%	40	20%	134	67%	66	33%	20.7	<0.001
The impact of infection with the COVID 19 during labor	30	15%	170	85%	190	95%	10	5%	175	87.5%	25	12.5%	49.03	<0.001
Prevention of exposure to infection with the COVID 19	74	37%	126	63%	175	87.5%	25	12.5%	168	84%	42	21%	13.9	<0.001
Precautionary measures to avoid the spread of the COVID 19	55	27.5%	145	72.5%	166	83%	44	22%	160	80%	40	20%	39.03	<0.001

| Items	Before program				After program immediately				After one month of program				X2	P value
	Correct answer		Incorrect answer		Correct answer		Incorrect answer		Correct answer		Incorrect answer			
	No	*%*	*No*	*%*	*No*	*%*	*No*	*%*	N	*%*	N	*%*		
COVID 19' vaccination	50	25%	150	75%	180	90%	20	10%	175	87.5%	25	12.5%	48.43	<0.001
Followed the right treatment for a pregnant woman if catches COVID 19	42	21%	158	79%	175	87.5%	25	12.5%	167	83.5%	33	16.5%	15.8	<0.001
Complications of COVID 19 infection	97	48.5%	103	51.5%	168	84%	42	21%	160	80%	40	20%	35.21	<0.001
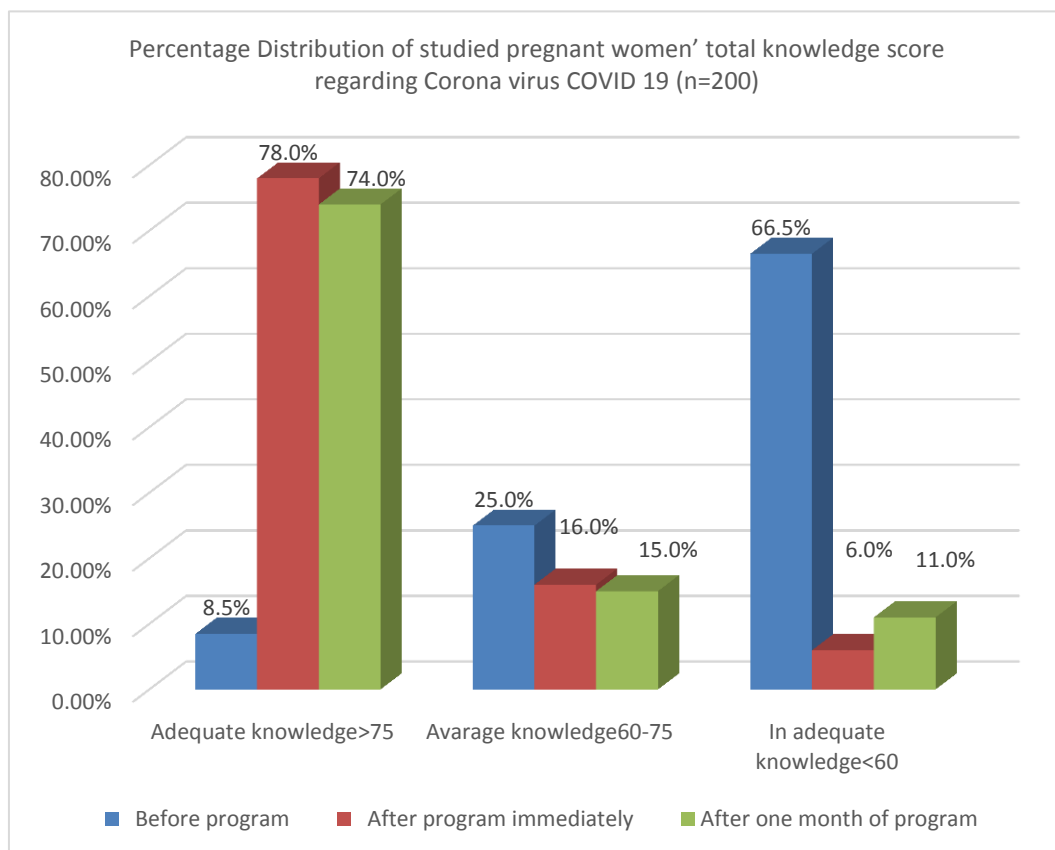
Figure (1): Percentage Distribution of studied women' total knowledge score regarding Corona virus COVID 19 (n=200)

Table (4): Percentage distribution of studied women' reported practice regarding   COVID 19'
Protective measures (n=200)

| Items	Apply before program				Apply after program				After one month of program				X2	P value
	acceptable		Un-acceptable		acceptable		Un-acceptable		acceptable		Un-acceptable			
	N	%	N	%	N	%	N	%	N	%	N	%		
Routine hand washing	61	30.5%	139	69.5%	158	79%	42	21%	155	77.5 %	45	22.5%	37.21	<0.001
Maintain a social distance	55	27.5%	145	72.5%	155	77.5%	45	22.5%	134	67%	66	33%	54.13	<0.001
Coughing technique	76	38%	124	62%	173	86.5%	27	13.5%	168	84%	42	21%	27.67	<0.001
safely consume medical and a non-medical mask or face shielding	45	22.5%	155	77.5	178	89%	22	11%	175	87.5 %	25	12.5%	19.8	<0.001
Avoidance of close contact with sick people and keeps physical distancing	44	22%	156	78%	128	64%	72	36%	134	67%	66	33%	48.27	<0.001
Maintain environmental cleaning and disinfection	50	25%	150	75%	160	80%	40	20%	155	77.5 %	45	22.5%	65.54	<0.001
Maintain good nutrition	76	38%	124	62%	173	86.5%	27	13.5%	160	80%	40	20%	27.67	<0.001
Maintain good rest and sleep pattern	55	27.5%	145	72.5%	166	83%	44	22%	158	79%	42	21%	39.03	<0.001
Vitamin supplementation maintenance	42	21%	158	79%	175	87.5%	25	12.5%	80	40	20%	155	15.8	<0.001
Regular follow up	65	32.5%	135	67.5%	173	86.5%	27	13.5%	128	64%	72	36%	27.67	<0.001
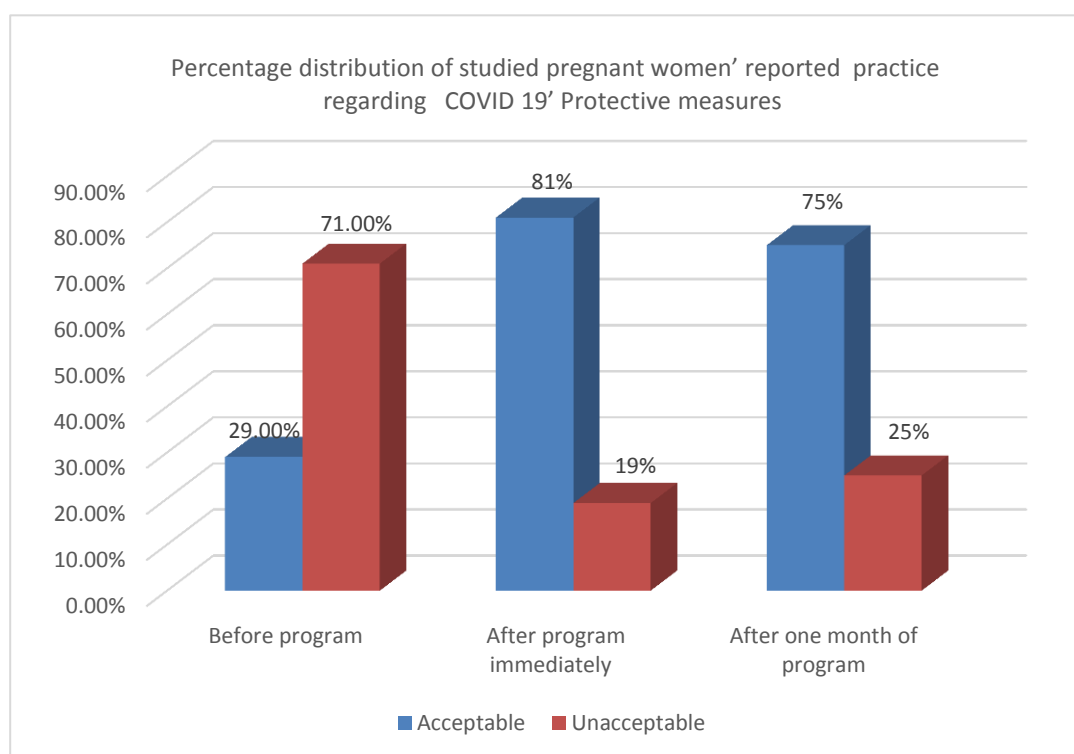
Figure (2): Percentage distribution of studied pregnant women' reported total practice regarding Corona virus
COVID 19 protective measures

Table (5): Percentage distribution of studied women' attitude regarding COVID 19 (n=200)

Attitude	Before program						After program						After one month of program						X2	P value
	Agree		Indifferent		Disagree		Agree		Indifferent		Disagree		Agree		Indifferent		Disagree			
	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%		
Infection with covid 19 can simply avoided	29	14.5%	107	53.5	64	32%	130	65%	60	30%	10	5%	127	63.5%	63	31.5%	10	5%	89. 85	<0. 001
Avoid exposed to crowded places	32	16%	120	60%	48	24%	110	55%	73	36.5%	9	4.5%	109	54.5%	80	40%	11	5.5%	98.53	<0. 001
wear a mask when you leave the house	30	15%	91	45.5%	79	39.5%	127	63.5%	63	31.5%	10	5%	120	60%	71	35.5	18	9%	125.83	<0. 001
Worry about contracting COVID-19 during childbirth or hospital stay after childbirth	21	10.5%	99	49.5%	80	40%	144	72%	45	22.5%	11	5.5	135	67.5%	55	27.5%	10	5	198.45	<0. 001
Worry about your newborn having COVID-19	27	13.5%	105	52.5%	68	34%	110	55%	73	36.5%	115	57.5%	75	37.5%	10	5%	115	57.5%	89. 85	<0. 001
The outbreak of the Corona virus will affect the type of delivery	18	9%	92	46%	90	45%	115	57.5%	75	37.5%	10	5%	113	56.5%	73	36.5%	14	7%	156.87	<0. 001
COVID-19 limit your face-to-face contact with others	32	16%	120	60%	48	24%	110	55%	73	36.5%	9	4.5%	109	54.5%	80	40%	11	5.5%	98.53	<0. 001
Constant washing of hands reduces infection with Covid 19	38	19%	140	70%	22	11%	117	58.5%	65	32.5%	18	9%	106	53.5%	84	42%	10	5%	149.45	<0. 001
Follow the news about COVID-19 on social media	21	10.5%	99	49.5%	80	40%	144	72%	45	22.5%	11	5.5	135	67.5%	55	27.5%	10	5	198.45	<0. 001
Worry about transmitting infection to the fetus in case of infection with Covid-19	25	12.5%	125	62.5%	50	25%	140	70%	55	27.5%	5	2.5%	126	63%	65	32.5%	9	4.5%	158.85	<0. 001
Worry in the event of infection with the Corona virus, a miscarriage or premature birth will occur	27	13.5%	105	52.5%	68	34%	110	55%	73	36.5%	9	4.5%	109	54.5%	80	40%	11	5.5%	110.53	<0. 001
you are feeling upset and anxious by FollowingCOVID-19 news	32	16%	120	60%	48	24%	115	57.5%	75	37.5%	10	5%	113	56.5%	73	36.5%	14	7%	145.98	<0. 001
your daily routine chores have affected negatively by COVID-19	38	19%	140	70%	22	11%	130	65%	60	30%	10	5%	113	56.5%	73	36.5%	14	7%	176.68	<0. 001
concerning COVID-19 consequences You have meditation dealing with it	30	15%	91	45.5%	79	39.5%	110	55%	73	36.5%	9	4.5%	106	53.5%	84	42%	10	5%	129.63	<0. 001

Table (5): Percentage distribution of studied women' attitude regarding COVID 19 (n=200)

| Attitude	Before program						After program						After one month of program						X2	P value
	Agree		Indifferent		Disagree		Agree		Indifferent		Disagree		Agree		Indifferent		Disagree			
	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%		
You sense maniac with hand washing and disinfectant matter	29	14.5%	107	53.5	64	32%	130	65%	60	30%	10	5%	127	63.5%	63	31.5%	10	5%	89. 85	<0. 001
your mood affected negatively by social distancing and home quarantine	18	9%	92	46%	90	45%	115	57.5%	75	37.5%	10	5%	113	56.5%	73	36.5%	14	7%	156.87	<0. 001
your sleep quantity and Quality affected negatively by COVID-19	21	10.5%	99	49.5%	80	40%	144	72%	45	22.5%	11	5.5	135	67.5%	55	27.5%	10	5	198.45	<0. 001
your stress regard COVID-19 have been controlled successfully	32	16%	120	60%	48	24%	115	57.5%	75	37.5%	10	5%	113	56.5%	73	36.5%	14	7%	145.98	<0. 001
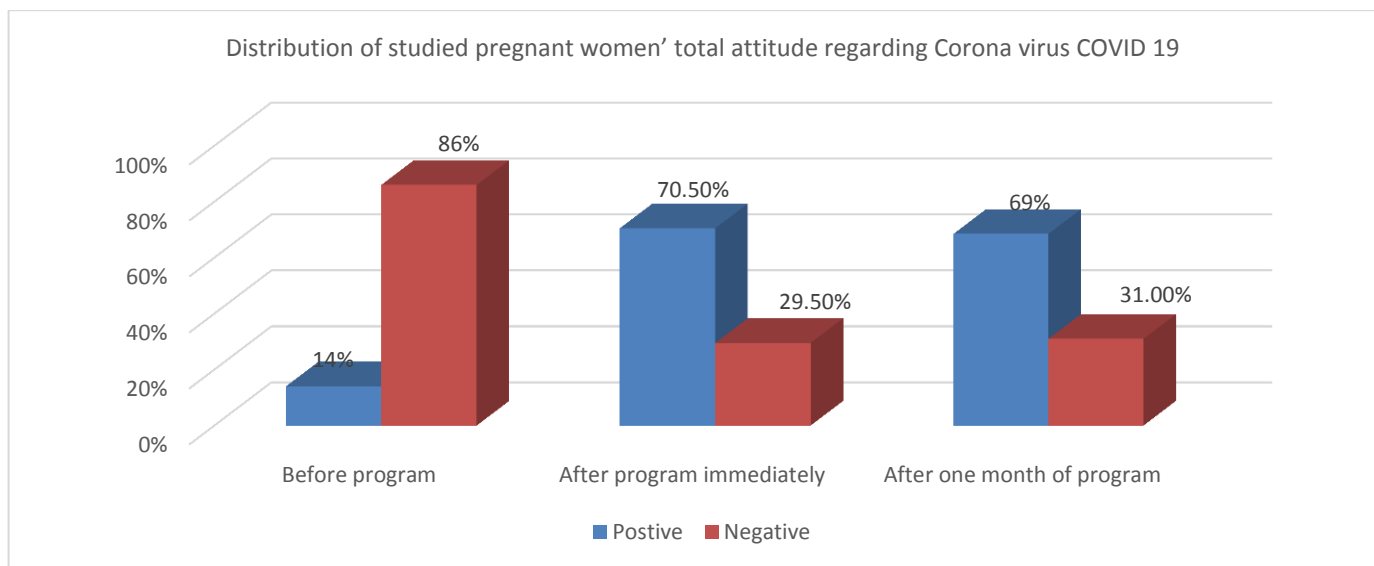
Figure (3): Distribution of studied pregnant women' total attitude regarding Corona virus COVID 19 (n=200)

Table (6): Correlation between knowledge and attitude among studied women regarding Corona virus COVID 19 (n=200)

Items	Total	Attitude of studied pregnant women before program				Total	Attitude of studied pregnant women after program immediately				Total	Attitude of studied pregnant women after one month of program			
		Positive 28		Negative 172			Positive 141		Negative 59			Positive 137		Negative 63	
	200	N	%	N	%	200	N	%	N	%	200	N	%	N	%
Adequate knowledge >75	17 17		8.5%	2	1%	165	135	67.5%	0	0%	148	129	64.5%	0	0%
Average Knowledge60-75	50	9	4.5%	40	20%	32	5	2.5%	9	4.5%	30	6	3%	13	6.5%
Inadequate Knowledge<60	133	2	1%	130	65%	6	1	0.5%	50	25%	22	2	1%	50	25%
X2 = 198.45 & P-value = <0.001															

Table (7): Correlation between   knowledge and practice among studied women regarding Corona virus COVID 19

Items	Total	Practice of studied pregnant women before program				Total	Practice of studied pregnant women after program immediately				Total	Practice of studied pregnant women after one month of program			
		Done 58		Not done 142			Done 162		Not done 38			Done 150		Not done 50	
	200	N	%	N	%	200	N	%	N	%	200	N	%	N	%
Adequate knowledge >75	17	17	8.5%	0	0%	165	142	71%	0	0%	148	138	69%	0	0%
Average Knowledge60-75	50	41	20.5%	10	5%	32	20	10%	8	4%	30	12	6%	6	3%
Inadequate Knowledge<60	133	0	0%	132	61.5%	6	0	0%	30	15%	22	0	0%	44	22%
X2 = 187.64 & P-value = <0.001															

Table (8): Distribution of studied women' satisfaction regarding Corona virus COVID 19 awareness programs

Items	Strongly Agree		Agree		Indifferent		Disagree		Strongly Disagree	
	No	%	No	%	No	%	No	%	N	%
Training objectives are clearly defined.	195	97.5%	3	1.5%	2	1%	0	0%	0	0%
The program covered all inquiry to prevent covid	197	98.5%	2	1%	1	0.05%	0	0%	0	0%
Participation is encouraged.	199	99.5%	1	0.05%	0	0%	0	0%	0	0%
The program was developed in easy and useful language	199	99.5%	1	0.05%	0		0	0%	0	0%
The program answer all of your questions	198	99	1	0.05%	1	0.05%	0	0%	0	0%
Content organized and understood.	195	97.5%	3	1.5%	2	1%	0	0%	0	0%
The teaching methods used were useful and effective	196	98%	3	1.5%	1	0.05%	0	0%	0	0%
Teaching materials used in this program has been useful for improving your practices.	197	98.5%	2	1%	1	0.05%	0	0%	0	0%

Discussion

Actually, pregnant females are mostly susceptible to communicable diseases that can develop maternal and fetal adversative consequences, equated to the non-pregnant females. Through pregnancy, Pregnant women experience a sequence of immunologic alterations that let the immune structure to receive and sustenance the growing fetus whereas still keeping tissue repair and antimicrobial protection. *(Coxon et al., 2020)*.

Concerning personnel characteristics of studied women, conferring studied women' age, it was observed that above the half of them

their age ranges from 20< 30yrs with the mean age ± SD   28.72±9.28 years. Concerning studied women' education it is noticeable that less than half of the studied women had secondary education. As regard studied residence, it was detected that less than three quarter of them were living in urban areas these results were identical with *Nwafor et al. (2020),* who study the practice and knowledge of protective measures against infection of COVID-19 amongst pregnant women in African low-resource setting and the study cleared that 24.6 ± 6.3 years was the mean age of the pregnant women, extra one third had high school. Moreover, majority of studied pregnant women was housewife. These results were considerable identical concerned the protective procedures against infection of COVID-19 and harmonized with outcomes informed by *Yassa et al. (2020)* in which furthermost Turkish pregnant women had reserved suitable protections against infection of COVID-19.

As regard obstetrical & medical history of the studied women. Regarding studied women' parity, more than half of them were primigravida nevertheless, these findings dissimilar with *Najmeh et al. (2020)*, who study entitled that "Knowledge and Attitude regarding COVID-19 among Pregnant Women in Southwestern Iran" and reported that extra one quarter of them were first pregnancy. from the researchers' point of view these results may be associated with marriage duration of studied women. Concerning studied women' antenatal attendance care visits it is noticeable that more two third of them were attended regularly. This result may be due to studied women' worry about catching COVID-19 during childbirth.

Considering to studied women' knowledge regarding Corona virus COVID 19 before program, after program immediately and after one month of program the study results It revealed that there is a highly statistically significant difference between the knowledge of the women studied, similar to the results of the current Clements study, (2020) that examined behaviors and knowledge among the US population towards COVID-19 in the United States, and indicated that famous pregnant women have satisfactory knowledge of COVID- 19 After an educational program

and the researchers' interpretation of it, these results were due to the beneficial awareness through educational materials of a program to enlighten the knowledge of pregnant women studied in relation to COVID 19.Furthermore, studied women' had adequate knowledge as it is noticeable that more than three quarter of the studied women have adequate knowledge after awareness program, and after one month of program. These results compatible with *Zhong et al. (2020*) in China, a study of practices, knowledge, attitudes among Chinese residents towards COVID-19. and reported that prevalent pregnant women had highly level of satisfactory knowledge of COVID-19 after informative program.

Regarding studied women' reported practice regarding COVID 19' protective measures the current study revealed that highly statistically significant difference of studied women' reported practice before program, after program immediately and after one month of program, consistent with the results from *Madappuram and kamal (2020)* who concluded and recommended that enlightening women' COVID-19 knowledge by health instruction, which might correspondingly outcome of enhancements in women' practices towards COVID-19. from the researchers' point of opinion these results may be resulting from improvement of studied pregnant women' knowledge regarding COVID-19 through awareness program benefit for advance studied pregnant women' behaviors such as identifying significant of protective measures, using disinfectant, hand washing and wearing mask.

Concerning studied women' reported total practice regarding Corona virus COVID 19 protective measures, additionally the study findings cleared that majority of the studied women, were have accepted total practice after awareness program, and after one month of program. These findings reinforced by *Miller, (2020).* who permitted that educating inhabitants' COVID-19 knowledge by strength health education towards COVID-19, which could likewise result in enrichments their behaviors of protective practices towards COVID-19. from the researchers' point of view these results likewise reproduced on studied women' consideration to precautionary advice, which may well be fixed in their advanced

grades of apprehensions about their own health and their children.

Based the current study results, highly statistically significant difference of studied women' attitude before program, after program immediately and after one month of program. Existing study results might be returned to the effectiveness of health awareness program in altering studied women` attitude from negative to positive attitude. Moreover, less than three quarter of the studied women, were have positive attitude after awareness program, and nearly three quarter after one month of program with compared to less than one fifth before awareness program. Nevertheless, these findings dissimilar with *Alemu, (2021)* who study aimed to assess attitude and knowledge among pregnant towards the current pandemic corona virus, in Northwest Ethiopia and reported that nearly half of study participants had a respectable positive attitude and knowledge concerning COVID-19. From the researchers' point of view these results also cerebrate the studied women' attention to protective measures, that could be firm in those superior grades of concerns regarding their newborns good health condition and also that of their own.

Furthermore, our study results established that there was highly statistically significance different between knowledge and attitude among studied women regarding Corona virus COVID 19. In addition, more than two third of studied pregnant women before health awareness program had negative attitude likewise had inadequate knowledge compared to nearly two third was after health awareness program while nearly two third was after one month of program had positive attitude likewise had adequate knowledge. These findings supported by *Najmeh, et al. (2020)* who study entitled that "Knowledge and Attitude regarding COVID-19 among Pregnant Women in Southwestern Iran" and conveyed that knowledge and attitude together manipulate and play significant role in infectious diseases prevention as Corona virus COVID 19. Moreover, this result propped by *Adela, et al. (2020)* who study in Cameroon the attitudes, practices, Knowledge, of COVID 19 symptoms and protective procedures and recommended that women ought to be the

principal target appointment for performance alteration initiatives by program administrators on understanding and administration of COVID 19 disease.

One of more considerable findings of present study is that above two third of studied women before health awareness program had unaccepted practice likewise had inadequate knowledge compared to nearly three quarter after health awareness program and above two third after one month of program had accepted practice likewise had adequate knowledge. Furthermore, highly statistically significance different (p< 0.001) amongst studied women' knowledge and practice. These results compatible with *Zaib and sarah. (2021)* who study the attitudes, practices, Knowledge, of COVID 19 among Pakistan and the results showed that significant and a positive relationship occurs between knowledge and practices. Nevertheless, the effect exposed through results of knowledge about COVID-19 on practice is weighty in the existence of attitude concerning COVID-19 like a moderator. From the researchers' point of estimation these results may be consequence from signifying that justified attitude concerning awareness of COVID-19 is displayed by acceptable attitude and harmonious knowledge on COVID-19, regard the protection of COVID-19 will driving to convenient protective practices for COVID-19.

Concerning studied pregnant women' reported satisfaction regarding Corona virus COVID 19 awareness program, our study results discovered that majority of studied women' were conveyed the strongly agree of the program covered all inquiry to prevent covid infection, teaching materials used in this program has been useful for improving them practices, also nearly all of them conveyed the strongly agree of the program was developed in easy and useful language, these results might be return to program was organized by natural simply Arabic tongue language and the awareness program comprised a convenient pictures and video for illustration. Thus, provide health awareness program to pregnant women about covid 19 will improve and assist pregnant women in attaining their highest level of holistic health.

Conclusion

Based on current research finding, the existing study reinforced the study hypothesis, that the health awareness program improved pregnant women' knowledge, attitudes and practice regarding Coronavirus disease Covid 19.

Recommendations

The following suggested recommendations are based on the light of existing research

Findings:

1- Heath awareness program regarding Corona virus COVID 19 should be conducted at all antenatal outpatient clinic setting for all pregnant women,

2- Amalgamate the awareness program into antenatal outpatient clinics maternity hospital, Ain shams university, through providing a copy print of the instructional pamphlet in outpatient clinics for pregnant women and their families concerning Corona virus COVID.

3-further research

Assess women health perception concerning protective vaccine against infection of Corona virus COVID-19

References:

Abdelhaz, A.S., Z. Mohammed, M.E. Ibrahim, et al. (2020): Knowledge, Perceptions, and Attitude of Egyptians towards the Novel Coronavirus Disease (COVID-19). J Community Health, DOI:10.1007/s10900-020- 00827-7

Adela, N., Lucia N, Lum, A., Jean T, Fabrice, M., Hamadama, et al. (2020): Knowledge, attitudes, practices of/towards COVID 19 preventive measures and symptoms: A cross-sectional study during the exponential rise of the outbreak in Cameroon, New Journal Introducing PLOS. Global Health. *Am J Trop Med Hyg. 2020 Dec; 103(6): 2368–2375.*

Alemu, D., Gedefaye, N. , Habtamu, G. , Adanech, G. , Bekalu, G. (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, *Int J Womens Health. 2021 Jan 8;13: 61-71.doi: 10.2147/IJWH.S285552.*

Bhardwaj, R. (2020): Mitigating the Adverse Consequences of Pandemics: A Short Note with a Special Reference to COVID-19. Available at SSRN 3565460.https://dx.doi.org/10.2139/ssr n.356546.

Centers for Disease Control and Prevention, (2019): Symptoms of Coronavirus - Coronavirus Disease 2019 (COVID-19). Retrieved 2020 May, from cdc.gov: https://www.cdc.gov/coronavirus/201 9-ncov/symptoms-testing/symptoms.

Centers for Disease Control and Prevention, (2020): CDC updates COVID-19 transmission webpage to clarify information about types of spread 2020; Available at https:// www. cdc. gov/ media/ releases/202 0/s0522-cdc-updates-covidtransmission.html. Accessed on 5/7/2020

Centers for Disease Control and Prevention, (2020): Characteristics of Women of Reproductive Age with Laboratory-Confirmed SARS-CoV-2 Infection by Pregnancy Status — United States, *January 22–June 7, 2020. Available at: https:// www. cdc. gov/ mmwr/ volumes/ 69/ wr/ mm6925a1. htm. Accessed July 26, 2020. [PMC free article] [PubMed] [Google Scholar]*

Clements JM, (2020): Knowledge and behaviors toward COVID-19 among US residents during the early days of the pandemic: cross-sectional online questionnaire. *JMIR Public Health Surveill* 6: e19161. [PMC free article] [PubMed] [Google Scholar]

Coxon K, Turienzo CF, Kweekel L, Goodarzi B, Brigante L, Simon A, Lanau MM, (2020): The impact of the coronavirus (COVID-19) pandemic on maternity care in Europe. *Midwifery 88:*

102779. [PMC free article] [PubMed] [Google Scholar]

Englund JA, Chu HY, (2018): Respiratory virus infection during pregnancy: does it matter? J Infect Dis 218: 512–515. [PMC free article] [PubMed] [Google Scholar**]**

Fan, Y., Zhang, S., Li, Y., Li, Y., Zhang, T., Liu, W. (2020): Development and psychometric testing of the Knowledge, Attitudes, and Practices (KAP) questionnaire among student tuberculosis (TB) patients (STBP-KAPQ) in China. *BMC Infect Dis [Internet]. [cited 2020 May 12]; 18(1). Available from: [Google Scholar]*

Feng, S., C. Shen., N. Xia, W. Song, M.Fan, and B.J. (2020): Cowling, rational use of face masks in the COVID19 pandemic. Lancet Respire Med, 8(5*): p. 434-436 DOI: 10. 1016/s2213-2600(20)30134-x.*

Hoda J. (2016): Identification of information types and sources by the public for promoting awareness of Middle East respiratory syndrome coronavirus in Saudi Arabia. Health Education Research*; 31(1):12–23. Doi: 10.1093/her/cyv061. [PMC free article] [PubMed] [Cross Ref] Google Scholar*

Jamieson DJ (2006): Theiler RN, Rasmussen SA. Emerging infections and pregnancy. Emerg Infect Dis. 12(11):1638-1643.

Madappuram. N. and Kamel.H., (2020): Covid19 and Pregnancy. *Annals of neonatology journal 2020; 2 (2):3 ISSN: 2636-3596, DOI:10.21608/ANJ.2020.29120.1011.*

Maharlouei N, Asadi N, Bazrafshan K. et al. (2020): Knowledge and attitude regarding COVID-19 among pregnant women in southwestern Iran in the early period of its outbreak: a Cross-Sectional Study. *Am J Trop Med Hyg*;2020. tpmd200608. doi:10.4269/ajtmh.20-0608

Miller, R (2020): Transmission and risk factors of COVID-19. Cleveland Clinic Journal of Medicine, 2020; Available at https://www.ccjm.org/content/early/202

0/ 05/ 12/ ccjm. 87a.ccc029. Accessed on 5/7/2020.

Ministry of Health-Egypt. MOHP (2020): COVID-19 Overview. May16.Available from: https:// www. care. gov.eg/Egypt Care/Index.aspx.

Najmeh. M, Nasrin. A, Khadijeh B, Shohreh. R, Abbas. R, Mohammad. Z, Fatemeh S , Ali K , (2020): Knowledge and Attitude regarding COVID-19 among Pregnant Women in Southwestern Iran in the Early Period of its Outbreak: A Cross-Sectional Study.

Nwafor JI, Aniukwu JK, Anozie BO, Ikeotuonye AC, Okedo-Alex IN, (2020): Pregnant women's knowledge and practice of preventive measures against COVID-19 in a low-resource African setting. *Int J Gynaecol Obstet 150: 121–123. [PubMed] [Google Scholar].*

Rana, M., Sayem, A., Karim, R., Islam, N., Islam, R., Zaman, T.K. (2020). Assessment of knowledge regarding tuberculosis among non-medical university students in Bangladesh: a cross-sectional study. BMC Public Health [Internet], 2015 Dec [cited 2020 May 12]; 15(1)

Rasmussen SA, Smulian JC, Lednicky JA, Wen TS, Jamieson DJ, 2020: Coronavirus disease 2019 (COVID-19) and pregnancy: what obstetricians need to know. *Am J ObstGynecol 222:415–426.* [PMC free article] [PubMed] [Google Scholar].

Shereen, M. A. et al. (2020). COVID-19 Infection: Origin, Transmission, and Characteristics of Human Coronaviruses. Journal of Advanced Research, 24, 91-98. https:// doi.org/10.1016/j.jare.2020.03.005

Shi S, Qin M, Shen B, et al. (2020): Association of Cardiac Injury with Mortality in Hospitalized Patients With COVID-19 in Wuhan, China [published online ahead of print, 2020 Mar 25]. JAMA Cardiol. 2020; e200950. doi:10.1001/jamacardio.2020.0950

Sonja A., et al (2020): Coronavirus Disease 2019 (COVID-19) and pregnancy: what obstetricians need to know, American Journal of Obstetrics & Gynecology, 222(5) :415:426.

Stirling, et al (2017): Communicating the Changing Role of a Nurse in an Epidemic: The Example of the MERS-CoV Outbreak in Saudi Arabia. Journal of Healthcare Communication *2017, 2:3. doi: 10.4172/2472-1654.100070*

World Health Organization. (2020): About COVID 19. Available: at http://www.emro.who.int/health-topics/corona-virus/situationreports.html.Accessed on4/7/2020.

Yassa M, Birol P, Yirmibes C, Usta C, Haydar A, Yassa A, Sandal K, Tekin AB, Tug N, (2020): Near-term pregnant women's attitude toward, concern about and knowledge of the COVID-19 pandemic. *J Maternal-Fetal Neonatal Med 33: 3827–3834. [PubMed] [Google Scholar].*

Zaib, M., Sarah, A., (2021): Knowledge, attitudes, and practices towards COVID-19 among Pakistan, *Published: September 4, 2020, https://doi.org/10.1371/journal.pntd.0008700.*

Zhong BL, Luo W, Li HM, Zhang QQ, Liu XG, Li WT, Li Y, (2020): Knowledge, attitudes, and practices towards COVID-19 among Chinese residents during the rapid rise period of the COVID-19 outbreak: a quick online cross-sectional survey. *Int J Biol Sci 16: 1745–1752. [PMC free art .*