EDUCATIONAL PROGRAM FOR MATERNITY NURSES REGARDING PRECAUTIONARY AND PREVENTIVE MEASURES AT LABOR UNIT DURING COVID 19

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ABSTRACT

Background: Coronavirus disease 2019(COVID-19) has been spreading globally, with severe impacts on health and economies. Nursing is an essential component of medical care, and nurses' knowledge, attitude, and practices (KAP) about the prevention and control of the disease directly affects patient's outcomes.

Aim: The study aimed to assess effect of educational program on maternity nurses regarding precautionary and preventive measures at labor unit during COVID 19. Design: A Quasi experimental design was used for conducting the study.

Setting: The study was conducted at Obstetrics and Gynecological Department in Benha University Hospital through Online meetings.

Sample: A convenient sample of a total nurses at Obstetrics and Gynecology department in Benha University Hospital were recruited for the study.

Tools: Three tools were utilized for data collection 1) A structured interviewing questionnaire: include two parts; a) Socio demographic characteristics b) nurses' knowledge regarding precautionary and preventive measures In labor unit during COVID 19. 2) Attitude likert scale to identify attitude of nurses towards precautionary and preventive measures in labor unit during COVID 19. 3) Nurses' self-Reported practices regarding infection control with precautionary and preventive measures at labor unit during COVID 19.

Results 41.1% of nurses had poor knowledge preprogram compared by 80% of nurses had good knowledge post program with high statistically significant difference between pre- and post-program p value= <0.001. Regarding total attitude, 32.2% had a negative attitude preprogram compared to 90% had a positive attitude post-program with significant differences p=<0.05 and high statistically significant difference regrading all other items of attitude between pre- and post-program p value= <0.001, Moreover 32.2% of nurses had unsatisfactory self-reported practices preprogram compared by 90% had satisfactory post program,

Conclusion: The implementation of educational program significantly improved studied nurses knowledge, practice and attitude post program regarding precautionary and Preventive Measures at Labor Unit During COVID 19

Recommendations: Implementing continuous educational and training program regarding infection control measures and other updates of COVID-19 for nurses.

Key words: COVID 19, Educational program, labor unit, Maternity nurses' precautionary measures

1. INTRODUCTION

The novel Coronavirus Infection (COVID-19), also termed SARS-CoV-2 (severe acute respiratory syndrome coronavirus) which emerged in December 2019 has become a global public health emergency and was declared a pandemic by the World Health Organization on the 11th March 2020. Symptoms of COVID-19 are nonspecific although most typically involve cough, shortness of breath and fever, and the disease presentation can range from no symptoms (asymptomatic) to severe pneumonia and death. Most people infected with COVID-19 virus have mild disease and recover. Approximately 80% of those infected have mild to moderate disease, 13-14% has severe disease and around 6% develop critical disease. Individuals at highest risk for severe disease and death include people aged over 60 years and those with underlying conditions such as hypertension diabetes and cardiovascular disease; mortality rates increase with age and disease in children seems to be both rare and mild (1).

Most women attending maternity services are healthy and are advised to maintain stringent social distancing. It is recognized that women may have significant anxiety about the possibility of contracting COVID-19 by attending maternity services, particularly where located in hospitals. It is important that maternity services do all they can to protect women from contracting COVID-19 during their maternity care by following guidance stringently and using appropriate personal protective equipment (PPE). It is also important to reduce the rate of transmission between staff. Staff should adhere to PPE guidelines and make every effort to observe social distancing measures at work, even when not patient facing. This includes hand washing, eating in designated areas and maintaining a distance of 2 meters between colleagues, where practical (2).

Labor presents a unique scenario in the COVID-19 pandemic, as all hospital admissions are anticipated and the timing of many admissions to the hospital is planned. In anticipation of hospital admission and to limit the risk of exposure, women should be instructed to discontinue work or begin working from home a minimum of 2 weeks before the anticipated date of delivery and to practice strict social isolation during this time. For most women, this should be initiated at about 37 weeks In addition, labour and delivery units should prepare simulations of the COVID-19 pandemic, including for donning PPE and so on. They should appropriate designated rooms and operating rooms for induction of labor or cesarean section. Consider screening for women with planned admissions each individual and her birthing partner by a telephone call the day before admission (3).

Nurses are the largest healthcare profession in the world, with approximately 20 million nurses worldwide (4). Nurses should have awareness and knowledge of the disease and infection control measures to prevent spread. However, empirical data reports COVID-19 is

challenging to nurses due to the novelty of the disease, this lack of information, training, and seminars to care for patients with the virus, and the psychological trauma resulting from patient deaths. Since it is such a new infection, misunderstanding COVID-19 signs and symptoms and incorrect treatment by nurses might speed the spread of hospital infection (5).

Nurses play a vital role locally and globally as well. Day in and day out they are on front lines for the patients affected by this virus. The care of the infected patients putting a direct risk to the nurses working with or caring a person with this disease which may cause many risks to the nurses which can be potentially harmful for their physical, and psychosocial health aspect **(6)**. All nursing and midwifery staff, including, nursing associates, and healthcare support workers, must familiarize themselves with their local policies on emergency planning, infection prevention and control. They should also keep up to date with national guidance issued by WHO and the UK governments and relevant UK Public Health agencies (7).

A comprehensive understanding of infection prevention and control is mandatory for nurses while seeking to protect themselves, patients, colleagues, and community. So taking it after the hand hygiene, understanding the key component of the proper use of PPE is when and how to put it on (don) and how to take it off (doff) again comes under lead responsibilities. Preventing the spread of infection to and from nurses and patients depends totally on prompt actions by the effective and proper use of PPE i.e cover all gowns or plastic aprons, Triple layer medical mask or N-95 Respirator mask, goggles, face shields and gloves, head and shoe cover (8).

It is important for the maternity nurse well training and have the knowledge to get perfect on skills, evidence based treatments and care modules to prevent the infection and promote the health and wellbeing of a patient in this situation of covid-19.Attending the staff development programs to upgrade the knowledge will be help to provide the compassionate care to the clients (9).

2. SIGNIFICANCE OF THE STUDY

As of 4 July 2020, 11,191,676 cases and 529,127 deaths have been reported globally **(10)**. Europe is the most affected region with 2,638,903 cases and the highest number of deaths 196,169. The African region is least affected with 268,102 cases and 5,673 deaths **(11)**. The International Council of Nurses' latest analysis shows that the number of nurses who have died after contracting COVID-19 is 1,500. Around 10 per cent of all cases globally are health-care workers, the ICN's analysis suggests, meaning more than two million health-care workers worldwide could have been infected with COVID-19 (12).

Pregnancy, childbirth, and postnatal state is a very important period in a woman's life and health and appropriate care is required during this period for prevention of maternal morbidity and mortality *(13)*. Maternity care providers (including midwives and all other health care workers providing maternal and newborn care), are essential health care workers and must be protected and prioritized to continue providing care to childbearing women and their babi (14).

This educational program helps nurses for care for pregnant women and their infants during the COVID-19 pandemic. It provides advice for maternity units around the provision of safe care to women and infants with suspected / confirmed COVID-19. It is a resource for healthcare staff working in the maternity services, sets out a framework for managing the impact on maternity services and provides principles to help units develop their own response plans. Information in this educational program has been prepared using a multidisciplinary approach with reference to the best information and evidence available. In addition this study not done previously at Benha Faculty of Nursing so this study was conducted.

3. AIM OF THE RESEARCH

This study was aimed to assess the effect of educational program among maternity nurses regarding precautionary and preventive measures at labor unit during COVID 19

This aim was achieved through:

- Assessing nurses' knowledge regarding precautionary and preventive measures at labor unit during COVID 19

- Assessing nurses' attitude regarding precautionary and preventive measures at labor unit during COVID 19.

- Assessing nurses' self-reported practices regarding precautionary and preventive measures at labor unit during COVID 19.

- Designing and implement educational program regarding precautionary and preventive measures at labor unit during COVID 19.

- Evaluating effect of educational program on maternity nurse's knowledge, attitude, and practices (KAP) regarding precautionary and preventive measures at labor unit during COVID 19 .

Research Hypothesis

Nurses' knowledge, attitude and practice regarding precautionary and preventive measures at labour unit during COVID19 will be improved after implementing the educational program.

Subjects and Methods

Research Design: A quasi experimental design was used for conducting the study.

Setting: The study was conducted in Obstetrics and Gynecological Department at Benha University Hospital through online meetings.

Sampling

Type: A convenient sample of all nurses at Obstetrics and Gynecology department in Benha University Hospital were recruited in the study.

Size: All maternity nurses 90 who worked at Obstetrics and Gynecology Department in Benha University Hospital.

Tools of Data Collection

Three tools were utilized for data collection, prepared by the researchers after reviewing related literature and tested by a panel of experts for validity.

First Tool: A structured interviewing questionnaire: Include two parts;

Part 1: Socio demographic characteristics of the study nurses:

Included age, educational level, years of experience, previous training program.

Part 2: Assessment of nurses' knowledge regarding precautionary and preventive measures in labor unit during COVID 19

which include:

1: General knowledge about COVID 19 as definition of CORONA virus and COVID 19, aetiology, incubation period, signs & symptoms, mode of transmission, high risk group for COVID 19, complications, methods of personal protective for preventing spreading the virus, precautions of infection control, priorities of nursing care for this infection, appropriate screening and testing, admission care, preventive measures during COVID 19 and sources of information.

2: Nurses knowledge about special care for the COVID-19–positive or suspected pregnant woman in labor, the COVID-19–positive/suspected woman who is critically ill).

Scoring System

The questions were scored as the following; score (2) was given for the complete correct answer, score (1) for the incomplete correct answer and score (0) for incorrect or don't know before and after application of the program. The total knowledge score was classified as the following:

- Good knowledge: ≥ 80%
- Average knowledge: 60 - < 80%
- Poor knowledge: < 60 %

Second Tool: Attitude likert scale: Adapted from Giao etal.,2020 (15)

Attitude of nurses towards precautionary and preventive measures in labor unit during COVID 19 was determined using 3 points likert scale agree, disagree, uncertain

Attitude comprised of 11 items towards infection control procedures and COVID 19.participants with overall lower score indicate negative attitude towards COVID 19.

Third Tool: Nurses' self-Reported practices regarding infection control with precautionary and preventive measures at labor unit during COVID 19

it was adapted from the Royal college of Obstetricians and Gynecologists 2020 (2) which covers the safety practices for caring of pregnant women who willing to labour even not infected and suspected or confirmed COVID-19 :

- Self- protection procedures.
- Instrument and equipment processing.
- Precautionary and preventive measures to COVID 19.

Scoring System

The checklist items were scored (1) for nurses' report done practice while (zero) score was given for nurses' report not done practice. The scores of total practices were considered as ≥ 80% was satisfactory and ≤ 80% was unsatisfactory.

4. METHODS

The study was executed according to the following steps

Approvals

A written official approval to conduct this study was obtained from both dean of benha faculty of nursing and the director of Benha University hospital that was taken and delivered to the director of the Obstetrics and Gynecology Department, in order to obtain their agreement to conduct the study after explaining its purpose.

Tools Validity and Reliability

The developed tool was reviewed for appropriateness of items and measuring the concepts through five an expert jury panel in the field of maternity nursing and obstetric medicine specialty to assure content validity. The questionnaires were modified according to the panel judgment on clarity of sentences and appropriateness of content (Reliability was done by Cronbach's alpha, (internal consistency for knowledge was 0.75 were, practice was 0.84 and attitude was 0.87).

Ethical Considerations

All ethical issues were assured, participants were given explanations about the purpose of the study, and they were also informed that they could withdraw from the study at any time before the completion of the study. Confidentiality of participants" information was assured and the data were collected only for research purpose.

The Pilot Study

The pilot study was conducted on 8 nurses (10% of 90 nurses) to test the clarity and the applicability of the tool, find out the possible obstacles and problems that might face the researchers and interfere with data collection. The study sample included in the pilot study was included also into the study due to no modification done in the tool.

Procedure

The process of data collection was carried out in the period from beginning of July 2020 to end December 2020. The researchers construct "Whats App Group" included all nurses who agree to participate in the study and all researchers of this study and the communication was through this group. Firstly one of researchers request from all nurses to download Zoom program and explain to them how to do this perfectly. And any lecture was done by inviting nurses to a scheduled Zoom meeting through Join Zoom Meeting as (https: us04web.zoom.us j6530147826?pwdLzVhdxjoeEdJRVdobVJzVXLaazBLDz09), Meeting ID (6530147826) and Passcode (159753) and time of lecture was determined .The researchers introduced themselves to the nurses and explain the purpose of the study. After taking consent, general characteristics of the studied nurses and their knowledge regarding precautionary and preventive measures in labor unit during COVID 19 were assessed using tool I (pretest). This sheet was filled electronically by sending a link on the Whats App Group and request from all participants to filled it. Also the second and third tool filled by the same way. By this way the researchers obtain pre test scores. Secondly the researchers design schedule including two lecture theory and four practical sessions and its time and download it to nurses in the "Whats App Group" and by consequences educational program was done on Zoom. The time needed for each theory lecture was one hour and 1.30 hour for each practical session. The frequency of sessions was 2 session per week on 7 o'clock at night. Thirdly all content of program collected in PDF booklet and download to all nurses on the group. Finally: Evaluation phase: Two weeks after implementation of an educational program, the evaluation done by the same format of the pre-test to assess the impact of the implemented educational program.

Statistical Analysis

The Data were analyzed using the Statistical Package for Social Sciences (SPSS) version 21 and then the data were explored. Descriptive statistics and correlation coefficients were used to test the research hypothesis. Descriptive statistics (frequency, percentage, arithmetic mean, and standard deviation) were used to describe characteristics of the studied nurses. Qualitative variables were compared using a Fisher's Exact test (FET) as the tests of significance. Paired (t) test was used to compare between mean differences before and after the intervention. The p-value is the degree of significance. A statistically significant difference was considered at p-value ≤ 0.05.

5. RESULTS

Table 1: shows the socio-demographic characteristics of studied nurses. It was clear that 35.6% of the studied nurses age between 30-40 years, with the mean age of 31.31±8.59. Also, it reveals that 71.1% of studied nurses had bachelor education. 41.1% experience less than 5 years.

Besides, 82.2% of the studied nurses' job description was nurses, and all of studied nurses had no previous training course regarding COVID19.

Table 2: Reveals that the majority(86.7%) of studied nurses incomplete correct knowledge regarding method of transmission COVIDE 19 pre program with a highly statistically significant difference post program p value= <0.001.furthermore about two thirds of studied nurses (61.1% 65.6%;68.9%)don't know nature of COVID 19 infection , symptoms and diagnosis pre program with a highly statistically significant difference post program p value= <0.001.moreover 76.7% ;86%.7% don't known complication and prevention of COVIDE 19 pre program with a highly statistically significant difference post program p value= <0.001.

Table 3: Portrays a highly statistically significant difference regarding knowledge about special care for the COVID-19–positive or suspected pregnant woman in labor pre- and post-program p value= <0.001

Figure 1: Illustrates that the majority (85.6%, 77.8%) of the studied nurses are the source of knowledge from television and social media, and more than half (53.3%) doctors are the source of knowledge while (25.6%) are posters.

Figure 2: Illustrates that less than half (41.1%) of studied nurses poor knowledge regarding COVID-19 preprogram while the majority (80%) of them had good knowledge post program .

Table 4: Demonstrates that 100% of studied nurses agree pre- and post-program about patients infected with corona virus should be kept in isolation. Also shows statistically significant relation about the spread and prevalence of corona virus can be prevented effectively through active participation of nurses in the hospital infection program between pre and post program p value <0.05 and reveals a highly statistically significant difference regarding all other items of attitude about COVID -19 pre and post program p value <0.001.

Figure 3: Illustrates that the (90%) majority of the studied nurses had positive attitude post program and one thirds (32.2%) negative attitude preprogram.

Table 5: Shows that all studied nurses (100%) wear disposable gloves during dealing with COVID 19 patients pre- or post-program with a highly statistically significant difference regarding self- protection procedures and instrument and equipment processing between pre- and post-program. while insignificant difference about Use hand detergents and sterilizers Alcohol between pre- and post-program p>0.05 furthermore and a highly statistically significant difference regarding all other item regarding additional precautionary and Preventive Measures to COVID-19 between pre- and post-program p value= <0.001.

Figure 4: Illustrates that majority of the studied nurses (90%) had satisfactory self-reported practices post program compared by one thirds (32.2%) of nurses had unsatisfactory practices preprogram.

Table 6: Portrays high significant positive correlation between total knowledge, attitude, and practices among studied nurses pre-program while highly statistically significant positive correlation p value< 0.001 between knowledge and practice post program and significant positive correlation between attitude and knowledge, practice post program p value< 0.05.

Table 7: Shows that a highly statistically significant positive correlation between knowledge and sociodemographic characteristic (age, education, and experience) pre- and post-program p<0.001. also demonstrates a highly significant positive correlation between attitude and demographics characteristics preprogram while significant correlation between attitude and age, experience, and Job description. Also reveals, a highly significant correlation between practice and demographics characteristics (education, experience and Job description) pre and post program p value <0.001.

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Table 1 Frequency distribution of studied nurses regarding socio-demographic characteristics (n=90).

Demographic characteristics	No	%
Age		
<20 years	9	10.0
20-30	28	31.1
30-40 years	32	35.6
>40	21	23.3
Mean ±SD	31.31±8.59	
Education		
Diploma nursing	9	10.0
Bachelor's degree graduate	64	71.1
Postgraduate	17	18.9
Experience		
Less than 5 years	37	41.1
5-10 years	32	35.6
More than 10y.	21	23.3
Job description		
Nurse	74	82.2
Nurse supervisor	10	11.1
Head nurse	6	6.7
Previous training course		
Yes	0.0	0.0
No	90	100.0

Table 2 Frequency distribution of studied nurses' regarding their general knowledge about COVID-19 pre and post program (n=90)

Knowledge items	Pre – program						Post- program						X^2	p-value
	Complete Correct		Incomplete correct		Do not know		Complete Correct		Incomplete correct		Do not know			
	No	%	No	%	No	%	No	%	No	%	No	%		
Definition of CORONA virus	21	23.3	32	35.6	37	41.1	73	81.1	17	18.9	0	0.0	70.35	.000**
Definition of COVID 19	12	13.3	58	64.4	20	22.2	81	90.0	9	10.0	0	0.0	107.02	.000**
Nature of COVID 19 infection	0	0.0	35	38.9	55	61.1	55	61.1	35	38.9	0	0.0	110.00	.000**
Incubation period	0	0.0	53	58.9	37	41.1	90	100.0	0	0.0	0	0.0	180.00	.000**
Etiology	37	41.1	24	26.7	29	32.2	90	100.0	0	0.0	0	0.0	75.11	.000**
Symptoms	0	0.0	31	34.4	59	65.6	73	81.1	17	18.9	0	0.0	40.17	.000**
Transmission	12	13.3	78	86.7	0	0.0	82	91.1	8	8.9	0	0.0	109.10	.000**
Diagnosis	0	0.0	28	31.1	62	68.9	55	61.1	35	38.9	0	0.0	117.77	.000**
Complications	0	0.0	21	23.3	69	76.7	47	52.2	26	28.9	17	18.9	78.97	.000**
Risk group of infection	0	0.0	29	32.2	61	67.8	44	48.9	37	41.1	9	10.0	83.59	.000**
Prevention	0	0.0	12	13.3	78	86.7	55	61.1	35	38.9	0	0.0	144.25	.000**
Precautions	29	32.2	19	21.1	42	46.7	56	62.2	26	28.9	8	8.9	32.78	.000**
Treatment	0	0.0	39	43.3	51	56.7	55	61.1	9	10.0	26	28.9	81.86	.000**

**p value= <0.001: Highly statistical significance

Table 3 Frequency distribution of studied nurses' regarding their knowledge about specific care for the COVID-19–positive or suspected pregnant woman in labor pre and post program (n=90)

knowledge about special care for the COVID-19 in labor	Pre – program						Post- program						X^2	p-value
	Complete Correct		Incomplete correct		Do not know		Complete Correct		Incomplete correct		Do not know			
	No	%	No	%	No	%	No	%	No	%	No	%		
Effect of CORONA virus on pregnant women	0	0.0	12	13.3	78	86.7	40	44.4	32	35.6	18	20.0	86.59	.000**
Care provided to suspected or confirmed COVID 19 parturient women on admission	0	0.0	21	23.3	69	76.7	47	52.2	25	27.8	18	20.0	77.24	.000**
Intrapartum management of women with suspected or confirmed COVID 19	0	0.0	21	23.3	69	76.7	47	52.2	34	37.8	9	10.0	96.22	.000**
Immediate post partum & neonatal care in women with suspected or confirmed COVID 19	0	0.0	0	0.0	90	100.0	56	62.2	16	17.8	18	20.0	120.00	.000**
Precaution taken by pregnant women to prevent infection by COVID 19	0	0.0	39	43.3	51	56.7	72	80.0	9	10.0	9	10.0	120.15	.000**
Precaution taken by professional health team to prevent infection by COVID 19	29	32.2	30	33.3	31	34.4	65	72.2	25	27.8	0	0.0	45.24	.000**
Emergency care for high risk group who confirmed COVID 19	0	0.0	29	32.2	61	67.8	47	52.2	25	27.8	18	20.0	70.70	.000**

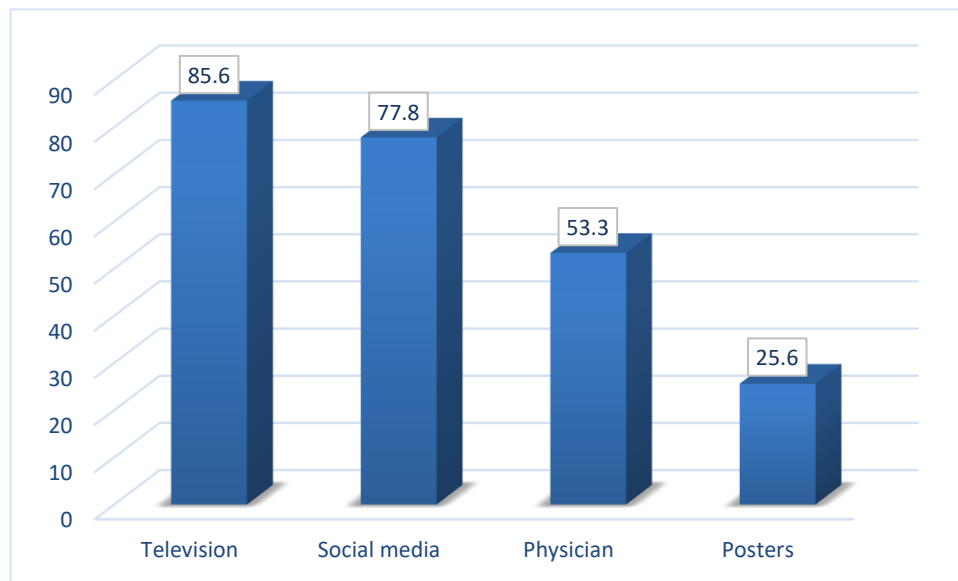***p value= <0.001: Highly statistical significance*

Figure 1 Percentage distribution of studied nurses regarding to their source of knowledge

Educational Program for Maternity Nurses Regarding Precautionary and Preventive Measures at Labor Unit during COVID 19
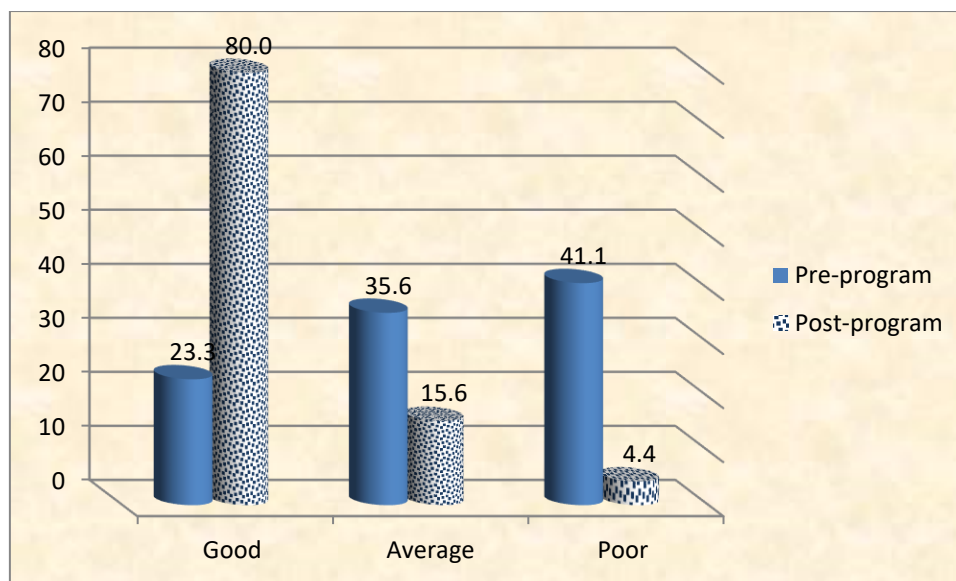

Figure 2 Percentage distribution of studied nurses regarding to their total knowledge about COVID-19.

Table 4 Frequency distribution of studied nurses' regarding their attitude about COVID -19 pre and post program (n=90)

| ITEMS | Pre – program | | | | | | Post- program | | | | | | X² | p-value |
| | Agree | | Uncertain | | Disagree | | Agree | | Uncertain | | Disagree | | | |
	No	%	No	%	No	%	No	%	No	%	No	%		
Nurses should familiarize themselves with all the relevant information about COVID - 19	45	50.0	45	50.0	0	0.0	71	78.9	19	21.1	0	0.0	16.39	.000**
Transmission and spread of corona virus can be prevented effectively through following precautionary measures advised by WHO	21	23.3	60	66.7	9	10.0	71	78.9	10	11.1	9	10.0	62.88	.000**
Any relevant information related to COVID 19 should be disseminated through all the health care professionals including nurses	47	52.2	43	47.8	0	0.0	81	90.0	9	10.0	0	0.0	31.26	.000**
The spread and prevalence of corona virus can be prevented effectively through active participation of nurses in the hospital infection program	39	43.3	33	36.7	18	20.0	55	61.1	26	28.9	9	10.0	6.55	.038
Patients infected with corona virus should be kept in isolation	90	100.0	0	0.0	0	0.0	90	100.0	0	0.0	0	0.0	-	-
Personnel protective equipment should be used while treating patients infected with corona virus	29	32.2	61	67.8	0	0.0	90	100.0	0	0.0	0	0.0	92.26	.000**
Improving awareness about COVID 19 is an important aspect in preventing the spread of infection	0	0.0	51	56.7	39	43.3	53	58.9	37	41.1	0	0.0	94.22	.000**
Not touching the eyes, nose and mouth during treatment can be beneficial in reducing the spread of infection.	21	23.3	18	20.0	51	56.7	72	80.0	18	20.0	0	0.0	78.96	.000**

| Item													X²	p-value
Covering the nose with a tissue during sneezing and coughing can spread the infection.	0	0.0	61	67.8	29	32.2	90	100.0	0	0.0	0	0.0	180.00	.000**
Lack of policies and procedures can be considered a barrier to the prevention of spread of corona virus	12	13.3	9	10.0	69	76.7	37	41.1	53	58.9	0	0.0	112.98	.000**
The commitment of nurses can be considered as important aspect of effective control of the spread of infection	0	0.0	0	0.0	90	100.0	37	41.1	53	58.9	0	0.0	180.00	.000**

**p value= <0.001: Highly statistical significance*
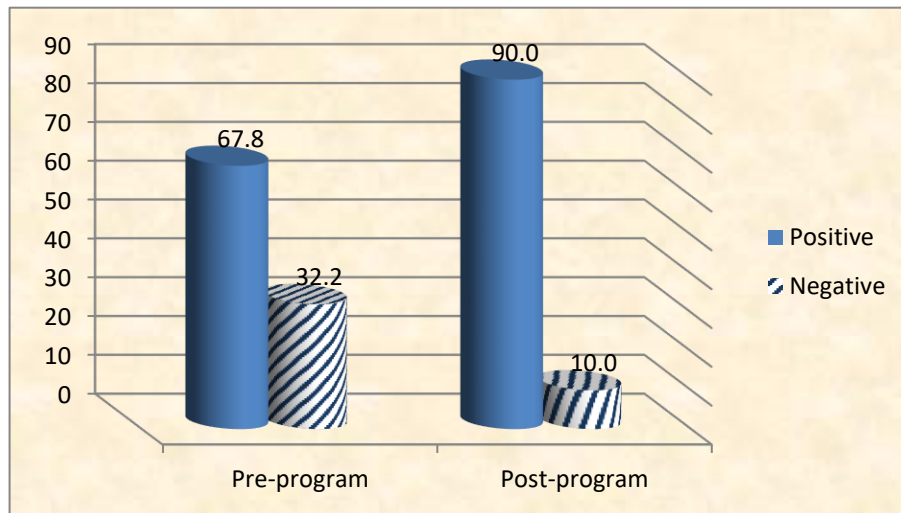
Figure 3 Percentage distribution of studied nurses regarding their total attitude about COVID-19

Table 5 Frequency distribution of studied nurses' regarding to their self-reporting infection control practices toward Precautionary and Preventive Measures at Labor Unit during COVID 19 pre and post program (n=90)

Items	Pre – program				Post- program				X²	p-value
	Done		Not done		Done		Not done			
Self-protection procedures	No	%	No	%	No	%	No	%		
Hand washing effectively with water and soup continuously.	12	13.3	78	86.7	54	60.0	36	40.0	42.20	.000**
Gloving during dealing with COVID 19 patients	90	100.0	0	0.0	90	100.0	0	0.0	-	-
Gowning	21	23.3	69	76.7	81	90.0	9	10.0	81.44	.000**
Masking especially when dealing with COVID 19 and in crowded places	29	32.2	61	67.8	54	60.0	36	40.0	13.97	.000**
Eye wear	31	34.4	59	65.6	63	70.0	27	30.0	22.80	.000**
Instrument and equipment processing										
Decontamination	0	0.0	90	100.0	54	60.0	36	40.0	77.14	.000**
Cleaning	21	23.3	69	76.7	81	90.0	9	10.0	81.44	.000**
High level disinfection	29	32.2	61	67.8	54	60.0	36	40.0	13.97	.000**
Sterilization	43	47.8	47	52.2	72	80.0	18	20.0	20.25	.000**
Additional Precautionary and Preventive Measures to COVID 19										
Use hand detergents and sterilizers Alcohol (60-90%)	53	58.9	37	41.1	63	70.0	27	30.0	2.425	.119
Make distances not less than 2 meters during communication.	21	23.3	69	76.7	63	70.0	27	30.0	117.00	.000**
Self-isolation for suspected or infected persons.	12	13.3	78	86.7	81	90.0	9	10.0	105.91	.000**
Don't share suspected or infected persons .in equipments	39	43.3	51	56.7	72	80.0	18	20.0	130.73	.000**
Don't touch face , eyes and nose by hands	70	77.8	20	22.2	90	100.0	0	0.0	22.50	.000**

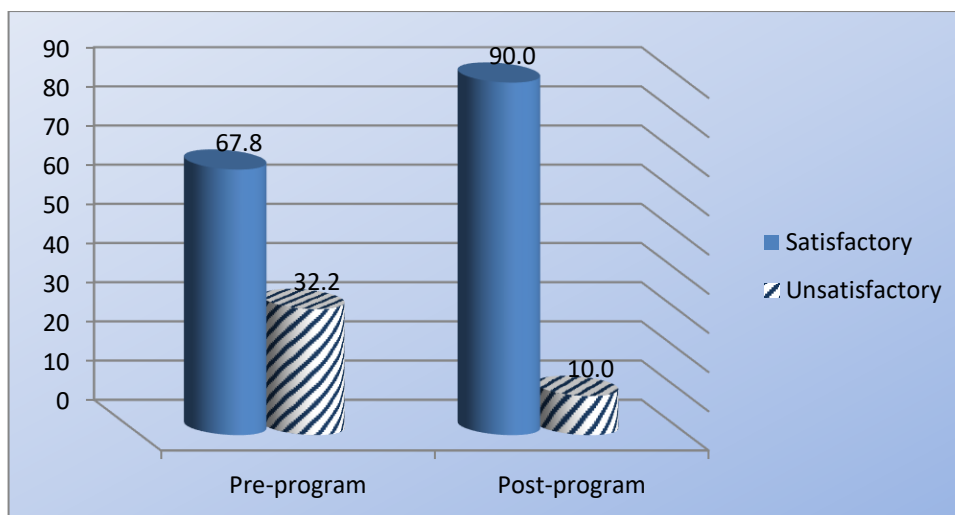**p value= <0.001: Highly statistical significance*

Figure 4 Percentage distribution of studied nurses regarding to their self-reported infection control
practices and preventive measures in labour unit during COVID-19

Table 6 Correlation matrix between total knowledge, attitude , and practices among studied nurses.

Items		Pre – program			Post- program		
		Total knowledge	Total attitude	Total practices	Total knowledge	Total attitude	Total practices
Total knowledge	r	1	.968**	.993**	1	.288**	.640**
	p-value		.000	.000		.006	.000
	N	90	90	90	90	90	90
Total attitude	r	.968**	1	.956**	.288**	1	.309**
	p-value	.000		.000	.006		.003
	N	90	90	90	90	90	90
Total- self reported practices	R	.993**	.956**	1	.640**	.309**	1
	p-value	.000	.000		.000	.003	
	N	90	90	90	90	90	90

Table 7 Correlation between nurses' total knowledge and nurses' demographics characteristics pre
and post program

Demographics characteristics	Knowledge				Attitude				Practice			
	Pre-program		post- program		Pre-program		post-program		Pre-program		post-program	
	R	p-value	r	p-value	R	p-value	R	p-value	r	p-value	R	p-value
Age	0.91	0.000	0.46	0.000	0.95	0.000	0.32	0.002	0.92	0.000	0.69	0.002
Education	0.52	0.000	0.43	0.000	0.62	0.000	0.20	0.052	0.50	0.000	0.45	0.000
Experience	0.95	0.000	0.42	0.000	0.96	0.000	0.30	0.004*	0.95	0.000	0.69	0.000
Job description	0.82	0.000	0.16	0.12	0.74	0.000	0.29	0.004*	0.81	0.000	0.55	0.000

6. DISCUSSION

Obstetric nurses play a vital role in healthcare setup in prevention, infection control, isolation,
continuous monitoring of the patients and because of their unique patient-facing nature, there
are occupational risks to providing care during the COVID-19 outbreak (16). There is
possibility of spreading Coronavirus in the absence of symptoms (17). During the time of labour
and delivery health care personnel is in close contact to patients, who are exerting extreme effort
during and frequently blow out their breath, cough, shout, and vomit, all of which put the health
care team at risk, considering that COVID-19 transmission occurs through aerosol generated

by coughing and sneezing(18). Protection of HCPs and prevention of intra-hospital transmission of infection are important aspects in epidemic response (19). Nursing is a basic component of medical care, and nurses' knowledge about COVID-19 directly affects patient outcomes. Similarly, during an outbreak, nurses' KAP play positive roles in improving the recovery rate, reducing the length of the hospital stay and mortality, and preventing in-hospital infection and occupational exposure (20, 21).

The present study was aimed to study the effect of educational program among maternity nurses regarding precautionary and preventive measures in labor unit during COVID 19. The results revealed improvement nurses knowledge, practice and positive attitude regarding precautionary and preventive measures in labor unit during COVID-19. This result support study hypothesis "Nurses' knowledge, attitude and practices regarding precautionary and preventive measures at labour unit during COVID19 will be improved after educational program".

The findings of the current study revealed that about one third of the studied nurses' age between 30-40 years, with the mean age of 31.31±8.59 and the majority of them had bachelor's education. While the majority of the studied nurses job description were nurses and less than half of them having experience less than 5 years. This may be due to the closure of some nursing schools and the interest in graduating a student with a bachelor's degree and the encouragement to complete higher studies to raise the efficiency of the nursing profession. Besides, all studied nurses had no previous training course regarding COVID-19. This may be due to Corona virus is a new disease that was under study and has spread rapidly across the world and the medical team was busy treating the infected cases.

The findings of this study in agreement with Al-Dossary , et al [22] who studied" Awareness, Attitudes, Prevention, and Perceptions of COVID-19 Outbreak among Nurses in Saudi Arabia" and mentioned that the mean age of the nurses was 33.92 (SD ±7.22). More than two thirds of the studied sample had bachelor's degrees 66.8%, but incongruent with Alwani et al., [23] who studied "Evaluation of Knowledge, Practices, Attitude and Anxiety of Pakistan's Nurses towards COVID-19 during the Current Outbreak in Pakistan" and reported that 10.3% were having Master's degree in nursing, 42.3% of the participant were holding a Bachelor's degree and 39.7% nurses were equipped with diploma in nursing and 7.7% were having education till high school or less. 38.5 % of the nurses were having experience of less than 5 years. The majority of nurses were having experience of 5-15 years. The difference may be due to different socio-demographic areas.

Nurses and midwives who care for individuals in the health system continue to work at the forefront to ensure public safety. Nurses and midwives are in close contact with individuals during the care process WHO,[24] Therefore, it was necessary to pay attention for improving nurses' knowledge regarding COVID 19 prevention and protection measures to prevent infection. The current study demonstrates that a highly statistically significant difference regarding general knowledge about COVID-19 pre- and post-program. This may be due to effect of educational program. This result in similar with Joshi et al., [25] they studied "Knowledge and awareness among nursing students regarding the COVID-19: a cross sectional study" reported that Over all 75.58±3.21 participants showed good knowledge and awareness about COVID-19. Around 87.47% respondents were aware about high risk age group for COVID-19. 83.54% participants were aware about concept of hand hygiene and 83.37% were well aware of PPE for suspected or confirmed COVID-19 cases also similar with Nemati, et al.,[26] they studied" Assessment of Iranian Nurses' Knowledge and Anxiety Toward COVID-19 During the Current Outbreak in Iran" mentioned that the Nurses had almost good knowledge about sources, transmission, symptoms, signs, prognosis, treat- ment, and mortality rate of COVID-19.

Regarding studied nurses' knowledge about special care for the COVID-19–positive or suspected pregnant woman in labour and delivery unit the current study revealed high statistically significant difference pre and post program. This may be due to the rapid spread of the disease and the interest of nurses to increased their information to protect themselves and pregnant women and the mother during and after childbirth and to protect the new born from infection because they are more susceptible to infection due to weak immunity. this result similar with Abdollahpour & Khadivzadeh,(2020) who study Improving the quality of care in pregnancy and childbirth with coronavirus (COVID-19): a systematic review , reported that Improving quality of care in pregnancy and childbirth, as well as educating, supporting and training healthcare providers in control of infection epidemic need to be prioritized. Also congruent with Institute of Obstetricians and Gynaecologists RCPI,[27] have developed an guidance to aid health care staff for care for pregnant women and their infants during the COVID-19 pandemic, It provides advice for maternity units around the provision of safe care to women and infants with suspected / confirmed COVID-19. It is a resource for healthcare staff working in the maternity services, sets out a framework for managing the impact on maternity services and provides principles to help units develop their own response plans.

The findings of the study showed that the majority of studied nurses revealed that the main source of knowledge regarding COVID 19 was television and social media while more than half the main source of knowledge was doctors and quarter of studied nurses were revealed that the source of knowledge was posters. .this result in agreement with Huynh, [28], who said that The main sources of COVID-19 information were social media and the Ministry of Health website (91.1% and 82.6%, respectively)similar with Ejeh,et al., [29] they reported that The most important sources of COVID-19 information were social media and television. Disagree with Nemati ,et al., [26] found that The sources of information for the nurses were the World Health Organization and the Ministry of Health (55.29%), social applications (48.23%), and media (42.35%). This may be due to the interest of the Egyptian media educating citizens about the Corona virus to limit the spread of the virus.

Concerning nursing attitude regarding covid-19 the current study revealed all studied nurses agree pre- and post-program about patients infected with corona virus should be kept in isolation. Also shows significant relation about the spread and prevalence of corona virus can be prevented effectively through active participation of nurses in the hospital infection program while a highly statistically significant difference regarding all other items of attitude about COVID -19 pre and post program. also revealed that the majority of the studied nurses had positive attitude post program compare to pre-program. This may be due to the effect of the educational program and also may be due to nurses afraid of getting infected was their fear to transmit the infection to their families because outbreak spread of infection.

This result agree with Abdel Wahed et al., [30]who studied "Assessment of Knowledge, Attitudes, and Perception of Health Care Workers Regarding COVID-19, A Cross-Sectional Study from Egypt" they observed among allied health workers positive attitude than physicians in many attitude items related to the government's role in diagnosis, treatment, and dealing with COVID-19 infections. Also, allied health workers were more confident in isolation hospitals' ability to treat COVID-19 patients than physicians. also similar with AlReshidi, [31] "who study Assessment of Saudi nurses' knowledge, attitude and anxiety towards COVID19 during the current outbreak in KSA" and founded that the majority of nurses positive attitude towards COVID-19. But disagree Huynh, et al., [28] who studied'' Knowledge and attitude toward COVID-19 among healthcare workers at District 2 Hospital, Ho Chi Minh City" they mentioned that Only 97.9% of the participants agree to isolation if it was needed. These results may be due to different socio demographic area and a lack of knowledge among nurses about important prevention and isolation strategies.

The current study also revealed that the majority of studied nurses satisfactory self-reporting infection control practices and Preventive Measures in Labor Unit During Covid 19 post program post program compare to pre program. Regarding Self-protection procedures and instrument and equipment processing revealed a high statistically significant difference between pre- and post-program and all studied nurses wear disposable gloves during dealing with COVID 19 patients respectively pre- or post-program. This result agrees with Sahiledengle, [32]. Who study "Decontamination of patient equipment: nurses' self-reported decontamination practice in hospitals of southeast Ethiopia" mentioned that 61.9% participants knew instrument processing is one of the basic components of standard precaution practice and one hundred 36.6% knew cleaning is the first step in instrument processing. Majority of the participants, 87.9% had awareness on how to prepare 0.5% decontaminant chlorine solution. Also consistent with CDC, [33] recommendation, all healthcare facilities that provide obstetric care must ensure that their personnel are correctly trained and capable of implementing recommended infection control interventions, including the use of personal protective equipment. Individual healthcare personnel should ensure they understand and can adhere to infection control requirements.

Also the finding of present study corresponded with Palatnik & McIntosh [18] indicated that labor and delivery personnel have the utmost caution and be granted the protection they need to protect themselves and other patients. This includes providing labor and delivery personnel full PPE including N95 for the second stage of labor. This is critical to ensure the adequate protection for health care workers and to prevent spread to other health care workers and patients. accordance with Ministry of Public Health[34] they reported that ,Infection prevention & control procedures should be implemented in health care facilities by all staff. Infection prevention & control procedures including administrative rules and engineering controls, environmental hygiene, correct IPC practices, and appropriate use of personal protective equipment (PPE) are all necessary to prevent infections from spreading during healthcare delivery.

Concerning Additional Preventive Measures to COVID 19 the current study revealed that more than half of studied nurses used hand detergents and sterilizers Alcohol pre program compare to more than two thirds post program with insignificant difference between them and a highly statistically significant difference regarding all other item about Additional Preventive Measures to COVID 19 pre- and post-program, this may be due to studied nurses face new pathogens and fear from getting infection. This similar with Zhang, [35] who study in China" Knowledge, attitude, and practice regarding COVID-19 among healthcare workers in Henan" which found the majority of the healthcare workers followed correct practices regarding COVID-19.

Furthermore the previously mentioned result congruent with Mbachu, et al ., [36] who study "COVID-19 infection: Knowledge, attitude, practices, and impact among healthcare workers in a South-Eastern Nigerian state" which found that the Majority of participants good preventive practices (n = 328, 81.39%) of COVID-19, A significant relationship between knowledge and practice implies that knowledge of all health workers should be improved to enhance the use of preventive practices. When health care workers observe good practices such as wearing face masks always and washing hands frequently with soap and water among others, it will go a long way in ensuring the safety of HCWs and communities, through reduction of transmission of disease among this group of people who may inadvertently spread the disease to their various communities. Also in the same line with Alrubaiee, et al., [37] who study Knowledge, attitudes, anxiety, and preventive behaviours towards COVID-19 among health care providers in Yemen: an online cross-sectional survey, it was found that the majority (87.70%) of respondents had a high-performance level of preventive behaviours towards

COVID-19, which could be attributed to the having an adequate level of knowledge and awareness among the respondents towards COVID-19.in parallel with Ejeh, et al., [29] who study" Knowledge, attitude, and practice among healthcare workers towards COVID-19 outbreak in Nigeria" said that A vast majority of the HCWs were taking precautionary measures such as avoiding crowded places (94.2%), washing of hands (96.0%), and the use of personal protective equipment (91.6%) against SARS-CoV-2 infection.

Concerning correlation between KAP the current study revealed high statistically significant positive correlation between total knowledge, attitude, and practices among studied nurses pre-program while highly statistically significant positive correlation p value< 0.001 between knowledge and practice post program and significant positive correlation between attitude and knowledge, practice post program p value< 0.05. This result disagree with Huynh, et al., [28] There was a negative correlation between knowledge scores and attitude scores (r=-0.21, P<0.001) also incongruent with Limbu ,[38] found a negative correlation between knowledge and attitude (r = -0.313, p = 0.001), however, knowledge didn't correlate with practice (r = 0.093, p = 0.35) but agree with Limbu [38] who reported that a significant correlation between attitude and practice (r = 0.298, p = 0.002) similar with Mbachu, et al ., [36] There was a significant relationship between the level of knowledge and practices of healthcare workers (p = 0.029). but disagree with Mbachu, et al ., [36] reported that Knowledge did not have any relationship with attitude (p = 0.477) nor attitude with practice.

Regarding relation knowledge and sociodemographic characteristics the current study showed highly statistically significant positive correlation between knowledge and sociodemographic characteristic (age, education, and experience) pre and post program p<0.001, while insignificant correlation between knowledge and job post program this result disagree with Nemati, et al., [26] found that The total knowledge score was not affected by age and education level and it was not significantly different between nurses with less or more work experience. also inconsistent with Kamineni ,et al., [39] who studied Knowledge of COVID-19 among nursing and Allied health care professionals working in tertiary care hospital, they founded there was no significant relationship between levels of knowledge with their socio demographic variables age, gender, education. this may be different sociodemographic area.

It was also observed highly significant positive correlation between attitude and demographics characteristics pre-program while significant correlation between attitude and age, experience and job, moreover insignificant negative correlation between attitude and education post program. The result similar with Huynh, et al., [28] founded that occupation was significantly associated with attitude. In our finding found highly significant correlation between practice and demographics characteristics (education, experience, and job) pre- and post-program p value <0.001. This result disagrees with Amanya,[40] who study" Knowledge and Compliance with Covid-19 Infection Prevention and Control measures among Health Workers in Regional Referral Hospitals in Northern Uganda: A cross-sectional Online Survey" The sociodemographic characteristics of health workers, including age, sex, education level, occupation, working hours and work experience, had no statistically significant relationship with Cvid-19 IPC knowledge or compliance.

7. CONCLUSION

Based on the findings of the current studied, it could be concluded that the majority of studied nurses had good knowledge ,positive attitude and satisfactory self-reported practices regarding precautionary and preventive measures at Labor Unit during COVID 19 post program with a highly statistically significant difference with pre-program , furthermore high statistically significant correlation between knowledge and practice pre and post program , and also high

statistically significant correlation between attitude and knowledge ,practice preprogram while significant correlation between attitude and knowledge ,practice post program, the above mentioned findings proved and reinforced the study hypothesis.

RECOMMENDATIONS

- Continuous training programs for nursing professionals can supplement their knowledge of risks and preventive strategies related to COVID-19, which will help them deliver proper care to their patients and keep themselves safe from the virus.
- Continuous provision of PPE and training of all nurses on proper infection prevention measures are serious and substantial.

FURTHER RESEARCHES

- Clinical guidelines for caring for women with COVID-19 during pregnancy, childbirth and the immediate postpartum period
- Barriers that contribute for the quick distributions and the reason for the reduction of the precautions toward this pandemic virus.
- A comprehensive public health education program is important to increase awareness and to reach sufficient knowledge.

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