Effect of Precautionary Measures Program on Pregnant Women's Knowledge, Attitudes and Practices regarding Novel Covid-19

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Abstract:

Background: Covid-19 is a highly contagious disease. Pregnant women may be at high risk for covid-19 infection because of physiological changes and immunity suppression during pregnancy. **Aim:** To evaluate the effect of precautionary measures program on pregnant women's knowledge, attitudes and practices regarding novel covid-19. **Design**: A quasi-experimental design was conducted on purposive sample (120 pregnant women) to fulfill the aim of this study. **Setting:** Obstetrics and gynecological outpatient clinics affiliated at Benha university hospitals. **Sample**: Purposive sample that fulfill inclusion criteria. **Tool:** Four main tools were utilized: tool (I) interviewing questionnaire schedule, tool (II) knowledge questionnaire sheet to assess women's knowledge regarding novel covid-19, tool (III) modified likert scale to assess attitudes of pregnant women regarding novel covid-19 and tool (IV) women's reported practices questionnaire to assess women reported practices regarding precautionary measures for novel covid-19. **Results:** There was a highly statistical significant difference between the results of pre-intervention and post-intervention phase regarding all items of studied sample's knowledge, attitudes and practices about novel covid-19 with p≤0.001. **Conclusion:** Precautionary measures program had a positive effect on pregnant women's knowledge, attitudes and practices regarding novel covid-19. **Recommendation:** Developing awareness program regarding global standard precaution for novel covid-19 to enhance knowledge, acquire positive attitudes and promote healthy practices for pregnant women**.**

Keywords: Attitude, Covid-19, Knowledge, practices, Precautionary Measures, pregnancy.

Introduction:

In early December 2019, an outbreak of coronavirus disease 2019 (covid-19), occurred in Wuhan City, Hubei Province, China. The pathogen which caused the pandemic was later renamed as severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) by the coronavirus study group and the disease was named covid-19 by the world health organization. On January 30, 2020 the world health organization declared the outbreak as a public health emergency of international concern **(Hollier, 2022)**.

Pregnant women infected with SARS-CoV-2 may be asymptomatic or symptomatic. Those who are symptomatic appear to be at increased risk for developing severe sequelae of covid-19 compared with non-pregnant reproductive-aged females **(Caliendo & Hanson, 2022)**.

There is association between pregnancy and covid-19 severe outcome using

multivariate analysis to prove that pregnant women are at higher risk for hospitalization, intensive care unit (ICU) admission, mechanical ventilator and death if infected with covid-19 **(BahaaEldin et al., 2021)**.

The anatomical and physiological changes occurring during pregnancy make the pregnant women more vulnerable to severe infections and contribute to increase the susceptibility for infection by intracellular organisms such as viruses and developing some pregnancy complications (eg, preterm birth) compared with uninfected or asymptomatic pregnant people **(Schwartz &Graham, 2020)**.

SARS-CoV-2, the virus that causes covid-19, is highly contagious; it causes a respiratory illness that ranges from the common cold-like symptoms to more severe diseases. Most of the infected patients complained of fever, shortness of breath, cough, loss of smell and/or taste sensation, myalgias, diarrhea and might be infected asymptomatically. In severe cases, patients might suffer from pneumonia, multiple organs dysfunction and death **(Saeed et al., 2021).**

SARS-CoV-2 spreads from an infected person to others through respiratory droplets and aerosols when an infected person breathes, coughs, sneezes, sings, shouts, or talks. The droplets vary in size, from large droplets that fall to the ground rapidly (within seconds or minutes) near the infected person, to smaller droplets, sometimes called aerosols, which linger in the air, especially in indoor spaces **(Government of Canada, 2021).**

Since the World Health Organization (WHO) announced that covid-19 is a worldwide pandemic, many countries' authorities, started responding and taking action to control the spread of the pandemic. The public's knowledge and practices play an important role in curbing the spreading of the virus by following the health guidelines **(Saeed et al., 2021)**. In the light of lacking consistent effective treatment, the best way to deal with the highly infective virus is by mitigating the spread of the virus. Several precautionary measurements are recommended to control the covid-19 spread **(Jaber et al., 2021)**.

(Royal College of Obstetricians and Gynecologists (RCOG), 2022) provide instructions for pregnant women during the pandemic; staying safe outside the home, using of face coverings, keeping mobile and hydration to reduce the risk of blood clots in pregnancy, staying active with regular exercise, maintaining healthy balanced diet, folic acid and vitamin D supplementation to help support a healthy pregnancy, attending all of pregnancy scans and antenatal appointments, contacting maternity team if having concerns about the wellbeing of mother or fetus and having a vaccine.

Nurses are the main healthcare professionals on the covid-19 frontline. Nurses working in units of maternity and newborn care could feel more stressful since they care for both mothers and their babies. The nurses' role could help pregnant women to be free from infection by teaching, coaching, counseling, collaborating and taking direct care. Moreover, if pregnant women know and understand the spreading and effects of the coronavirus on pregnant women and fetuses in utero, this knowledge could help them to be able to take good care of their fetuses and continue carrying out quality pregnancy and birth **(Chaleoykitti & Srisawad, 2020)**.

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Significance of the Problem

Pregnant women are more susceptible to the virus and show a worse prognosis due to physiological and immunological changes during pregnancy. Study in United Kingdom reported that the estimated incidence of admission to hospital with confirmed SARS-CoV-2 infection in pregnancy was 4.9 per 1000 maternities **(Knight et al., 2020)**.

Previous studies showed that pregnant women's morbidity and mortality related to influenza virus are higher than non-pregnant women so, the precautionary measures program regarding covid-19 play an important role in changing the faulty behaviors and identifying the kind of intervention that is needed to correct the misconceptions regarding the virus, highlight the poor knowledge toward the virus and disease, development of new preventive measures and take precaution **(Hanawi et al., 2020)**. There is no study done in this area in women's health and obstetrics nursing department at Benha faculty of nursing. So, there is an urgent need to implement precautionary measures program for pregnant women to enhance their awareness regarding to novel covid-19.

Aim of the study

To evaluate effect of precautionary measures program on pregnant women's knowledge, attitudes and practices regarding novel covid-19.

Research hypotheses

H1: There will be enhancement in pregnant women's knowledge regarding novel covid-19 after implementation of precautionary measures program.

H2: The pregnant women will have positive attitudes regarding novel covid-19 after implementation of precautionary measures program.

H3: The pregnant women will acquire healthy practices regarding novel covid-19 after implementation of precautionary measures program.

Research design:

A quasi-experimental study design was used in this study (pre post-test).

Research setting:

The study was conducted at obstetrics and gynecological outpatient clinic affiliated at Benha university hospitals.

Sampling:

- **Sample type:** A purposive sample was used.
- **Size:** The sample size was determined by time (nine months) and included pregnant women attended to the previous mentioned setting and time with following criteria:

Inclusion criteria:

1- Pregnant women with gestational age ≤ 28 weeks.
2- Pregnant women without medical and obstetric problem.
3- Pregnant women agree to participate in the study.
4- Pregnant women have telephone or Whats App.

Tools for data collection:

It included four main tools:

Tool (I): Interviewing questionnaire schedule: It was prepared by the researcher, the guidance of supervision and after reviewing related literature **(Zhao et al., 2020)** & **(Ayele et al., 2021)**. It included two parts:

Part (1): - Personal data: it included 8 items concerning with (age, level of education, residence, working, infected person in family, person recovered from covid-19, person dead

from covid-19 and sources of information about covid-19)

Part (2): Obstetrics history: it included 5 items such as (gravity, parity, gestational age, antenatal visits and having chronic diseases.)

Tool (II): - Knowledge questionnaire sheet: it was constructed by the researcher, the guidance of supervision and after reviewing related literature **(Labban et al., 2020) &** (**Erfani et al., 2020**) to assess women's knowledge regarding novel covid-19, it consisted of 27 questions in form of MCQ and true or false questions.

Scoring system:

Each item was assigned a score of (3) was given when the answer is correct answer, a score (2) was given when the answer is incorrect answer and a score (1) was given when the answer is don't know. The total score of knowledge for participants was classified as the following:

- Poor when the total scores less than 50%.
- Average when the total scores 50% to less than 75%.
- Good when total score 75% to 100%.

Tool (III): Modified likert scale:

It was adapted from **(Shahbaznejad et al., 2020)** & **(Labban et al., 2020)** to assess attitudes of pregnant women regarding novel covid-19**.** It is a three-point likert type scale. It includes 15 statements.

Scoring system:

Each statement was evaluated according to three-point scale was ranged from agree (1 scores), uncertain (2 scores), and disagree (3 score). The total score was summed and categorized as the following:

- Negative attitude when the total score < 75%

- Positive attitude when the total score ≥ 75%.

Tool (IV): Women's reported practices questionnaire (precautionary measures):

This tool was conducted by the researcher after reviewing related literature as (**Alahdala et al., 2020**) & (**Ifunanya et al., 2020**) to assess women reported practices regarding precautionary measures for novel covid-19, it was include 5 main practices [washing hands (11 items), wearing mask face(10 items), social spacing (7 items), isolation measures (10 items) and immunity enhancement measures (5 items).

Scoring system:

Each item was assigned a score of (3) given for always done, a score (2) given for sometimes done and a score (1) given for never done. The total score of practices was classified into two categories as following:

- Satisfactory level when the total scores > 75%.
- Unsatisfactory level when the total scores ≤ 75%.

Tool validity and reliability

Tools validity: the tools' content validity was revised by three experts (obstetrics and gynecological nursing professors) for appropriateness of items and measuring the concepts to assure content validity, no modification was done.

Reliability: the tool questionnaire was modified related to clarity of sentences and appropriateness of content. Reliability was done by Cronbach's Alpha coefficient test for testing the internal consistency of tools. The internal consistency of knowledge was (81.8%), attitude was (82%) and practice was (75.2%).

Ethical considerations:

Ethical aspects were considered before starting the study as the following:

- The study approval was obtained from the Scientific Research Ethical Committee of the Faculty of Nursing at Benha University for fulfillment of the study.
- An official permission from the selected study settings was obtained for the fulfillment of the study.
- Before applying the tools, the researcher explained the aim and importance of the study to gain women's confidence and trust.
- The researcher took oral consent from women to participate in the study and confidentialities was been assured.
- The study wasn't having any physical, social or psychological risks on the women.
- All tools of data collection were burned after statistically analysis to promote confidentiality of the participating women.
- The study tools were been ensured that the study don't cause any harm for any women during data collection. Also don't include any immoral statements and respect human rights.
- The women given an unconditional right of withdrawal at any time.

Pilot study:

The pilot study carried out on ten percent (10%) of the total time, it was about 4 weeks (8 cases) to test the research tools' simplicity, clarity and applicability and estimated the time required to fill in the tools. There wasn't any modification done, but pilot sample was excluded to avoid contamination of the sample

Fieldwork:

Implementation of the study was carried out at Obstetrics and Gynecology outpatient clinic. Data was collected and covering nine (9) months. The researcher visited out- patient clinics two days/week (Saturdays and Mondays) from 9.00 a.m. to 12.00 p.m.

This study was conducted through five sequential phases; preparatory phase, interviewing and assessment phase, planning phase, implementation phase and evaluation phase.

The preparatory phase:

It is the first phase of the study. A review of current and past national and international relevant literature related to novel covid-19 carried out using local and international textbooks, journals, periodicals, and computer searches to develop the study tools and contents .

Interviewing and assessment phase:

At the beginning, the researcher met the women in waiting room of outpatient clinics, greeted the women, introduced himself, explained the purpose of the research, and provided the women with all information about the research (purpose, duration, and program) to gain confidence and cooperation, and then obtain the informed oral consent to participate in the study.

Planning phase

The data obtained during pretest assessment was analyzed and it was indicated; there was poor knowledge, negative attitude and unsatisfactory precautionary practices regarding covid-19 and the researcher determined their need to make stress on those needs during session.

Implementation phase:

Implementation of the program sessions were carried out at the pre-mentioned setting or by Whatsapp. The overall sessions were three sessions (2 theoretical and 1 practical) for each group of women time of session was determined according to women's physical

and mental readiness ranged from 30-45minutes; included periods of discussion according to women's achievement, progress, and feedback .

The first session was conducted and included theoretical part (definition of covid-19, source of infection, incubation period, mode of transmission, asymptomatic infection, common less and danger symptoms and risk group).

The second session was conducted and included theoretical part (immunological, respiratory system, cardiovascular system changes during pregnancy that increase susceptibly for infection, prognosis of covid-19 and its complication on pregnant woman and fetus).

The third session was conducted and included practical part; precautionary measures regarding novel covid-19 such as washing hands, wearing mask face, social spacing, isolation measures and immunity enhancement measures.

Evaluation phase

The researcher evaluated effect of precautionary measures program on pregnant women's knowledge, attitudes and practices regarding novel covid-19 (as posttest) by using the same format in pretest intervention compared to the finding of pre intervention (as pretest).

Statistical analysis:

After data collection each sheet was scored and data were organized and categorized. Result were presented in tables and analyzed by using the statistical package for social sciences (SPSS) program version (22). Numerical qualitative data were expressed as frequencies and percentages. As well mean, standard deviation (SD), Chi-square and paired T test were used to examine the relation between qualitative variables. Significance of result was considered as the following: there is no statistical significance difference when $p>0.05$, there is statistical significance difference when $p\leq0.05$ and there is a highly statistical significant when $p\leq 0.001$.

Limitation of study

The researcher met barrier to get responses from some pregnant women, this may be due to fear from infection and contact with others.

Results:

Table (1) shows Personal characteristics of the studied sample. It was cleared that more than half (58.3%) of studied sample were in age group 18 - 25 years with a mean age of 23.02 ± 7.57 years. As regards the residence, less than two-thirds (60.8%) of them lived in rural areas. Furthermore, less than two-thirds of them (57.5%) were housewives. Regarding the educational level, more than one-third (34.2%) of them had secondary education. Moreover; less than two-thirds (65.0%) of them had a person infected with COVID-19 in their family but less than three-quarters (70.0%) of them know someone who has been cured from COVID-19. Finally, less than three-quarters (74.0%) of them didn't know someone who died from COVID-19.

Table (2) illustrates that, more than half (56.7%) of the studied sample were primigravida and more than half (58.3) of them were nullipara with a mean gestational age of (21.94 ± 4.72) weeks. Additionally, more than two third (66.7%) of them weren't compliant with antenatal care follow-up.

Fig (1) displays that, (10.0%) and (68.4%) of studied sample had good knowledge regarding Novel Covid-19 at pre-intervention and post-intervention phases respectively. While, it was revealed that (70.8%) and (20.8%) of studied sample had poor knowledge regarding Novel Covid-19 at pre-intervention and post-intervention phases respectively.

Fig (2) displays that, (33.3%) and (78.3%) of studied sample had positive attitude regarding Novel Covid-19 at pre-intervention and post-intervention phases respectively. While, it was cleared that (66.7%) and (21.7%) of studied sample had negative attitude regarding Novel Covid-19 at pre-intervention and post-intervention phases respectively.

Fig (3) displays that, (30.8%) and (81.7%) of studied sample had satisfactory level of reported practices regarding Novel Covid-19 at pre and post-intervention phases respectively. While, it was revealed that (69.2%) and (18.3%) of studied sample had unsatisfactory level of healthy practices regarding Novel Covid-19 at pre and post-intervention phases respectively.

Table (3) clarifies that there was a highly significant statistical positive correlation between total knowledge and (total reported practices & total attitude) regarding Novel Covid-19 at pre-intervention and post-intervention.

Table (1) Distribution of the studied sample according to their Personal characteristics (n=120).

Personal characteristics	No	%
Age:		
18 - 25	70	58.4
26 - 30	24	20.0
31 - 35	13	10.8
>35	13	10.8
Mean ± SD = 23.02±7.57		
Residence:		
Urban	47	39.2
Rural	73	60.8
Level of education:		
Illiterate	10	8.3
Primary education	16	13.3
Preparatory education	24	20.0
Secondary education	41	34.2
University education	29	24.2
Occupation:		
Housewife	69	57.5
Employed	51	42.5
Presence of a person infected with COVID-19 in woman's family:		
Yes	78	65.0
No	42	35.0
Knowing someone who has been cured from COVID-19		
Yes	84	70.0
No	36	30.0

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Table (2): Distribution of the studied sample regarding their obstetrical history (n=120).

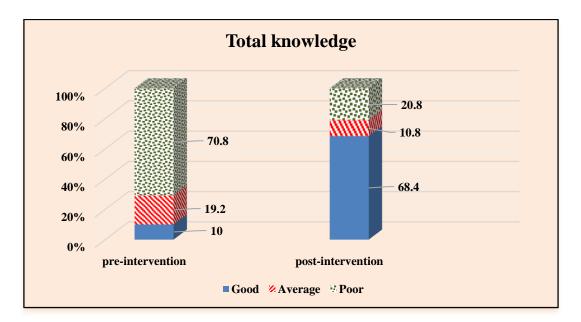| Obstetrical history	No	%
Gravida:		
Primigravida	68	56.7
Multigravida	52	43.3
Parity:		
Nullipara	70	58.3
Primipara	33	27.5
Multipara	17	14.2
Current gestational age in weeks:		
Mean ± SD = 21.94±4.72		
Compliance with Antenatal care follow up:		
Yes	40	33.3
No	80	66.7

Figure (1): Percentage distribution of studied sample regarding their total knowledge score about Novel Covid-19 at pre-intervention and post- intervention phases (n = 120).
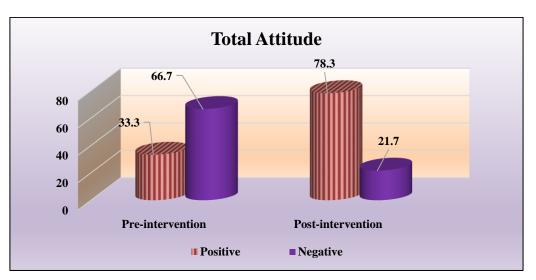
Figure (2): Percentage distribution of studied sample regarding their total attitude score about Novel Covid-19 at pre- intervention and post- intervention phases (n = 120).
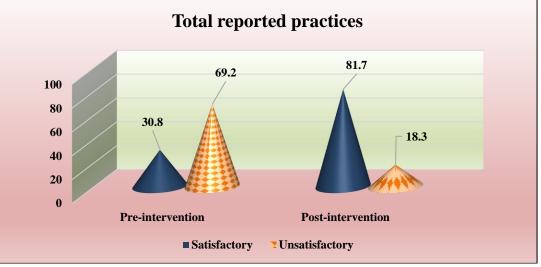

Figure (3): Percentage distribution of studied sample regarding their total reported practices score about Novel Covid-19 at pre and post- intervention phases (n = 120).

Table (3): Correlation between total knowledge, attitude and total reported practices score of the studied sample regarding Novel Covid-19 at pre and post intervention phases (n = 120).

| Variables | Total knowledge | | | |
| | Pre | | Post | |
	r	P-value	r	P-value
Total reported practices	0.534	.000**	0.504	.000**
Total attitude	0.559	.000**	0.513	.000**

**A Highly Statistically significant p ≤ 0.001

Discussion

Infectious diseases can play a significant role in pregnancy, particularly by affecting maternal and fetal outcomes. The pregnant woman will undergo a series of complicated processes to ensure the acceptance of fetus,

and these physiological changes in the immune, respiratory, and circulatory systems may makes pregnant women generally more susceptible to infection, severe illness and serious complications. So, extensive precautions have been recommended to avoid exposure to the virus. Knowledge and attitude toward the disease play an integral role in readiness to accept public health measures and prevent spread of disease **(Besho et al., 2021).**

The research's hypotheses were supported by the findings of the present study as well as the following parts:

Concerning part (I) personal characteristics the finding of the current study revealed that more than half of studied sample were in age group 18 - 25 years with a mean age of 23.02±7.57 years. As regards the residence, less than two-thirds of them lived in rural areas. Furthermore, less than two-thirds of them were housewives and more than one third of them had secondary education. Moreover, more than two-thirds of them have not had a person infected with COVID-19 in their family but less than three-quarters of them know someone who has been cured from COVID-19. Finally, less than three-quarters of them didn't know someone who died from COVID-19.

These findings were in the same line with **Kumbeni et al., (2021)** in Northern Ghana who conducted study entitled "Knowledge and preventive practices towards COVID-19 among pregnant women seeking antenatal services " found that more than one third of studied women aged 18–22 years old (37.0%).

On the other hand, the study findings contradicted with **Ayele et al., (2021)** in Debre Tabor Northwest Ethiopia who conducted "Knowledge and practice to prevent COVID-

19 and its associated factors among pregnant women, a community-based cross-sectional study" indicated that more than half of the women (56.8%) were belonged to the age group of 25–34 years with mean age of the participant was 27.15 (SD ± 4.719) years. This difference in result may be due to the difference in sample size.

In relation to part (II): obstetrical history of the studied women the current study illustrated that, more than half of the studied sample was primigravida, less than two-thirds of them were nullipara with a mean gestational age of (21.94±4.72) weeks and more than two third of participants weren't compliant with antenatal care follow up.

The result of present study matched with **Ding et al., (2021)** who showed that two-thirds of the participants either postponed their antenatal visits or reduced the visits' frequency. The researcher point view, the cause of non-compliance with antenatal care follow up may be due to fear from infection with covid-19 especially pregnant women are among the most vulnerable group. Moreover, the government recommended reducing outdoor visits in unnecessary cases.

Regarding part (III) the effect of precautionary measures program on pregnant women knowledge regarding COVID 19, the result of present study showed that minority and more than two-third had good knowledge regarding Novel Covid-19 at pre-intervention and post-intervention phases respectively. While, it was revealed that less than three-quarters and more than one fifth of studied sample had poor knowledge regarding Novel Covid-19 at pre-intervention and post-intervention phases respectively. This result ensured that the educational program succeed

in increasing the knowledge of the participants.

The finding of present study got matches with **Fikadu et al., (2021)** in Guraghe Zone Hospitals who studied "COVID-19 Preventive Measure Practices and Knowledge of Pregnant Women" indicated that near half of the participants has inadequate knowledge.

Regarding part (IV): the effect of precautionary measures program on pregnant women attitude regarding COVID 19, the result of current study displayed that, one-third and more than three-quarters of studied sample had positive attitude regarding Novel Covid-19 at pre-intervention and post-intervention phases respectively. While, it was cleared that two-third and one-fifth of studied sample had negative attitude regarding Novel Covid-19 at pre-intervention and post-intervention phases respectively.

The findings of present study were supported by **Helmy et al., (2021)** in Egypt who studied **"**Effect of Tele-health Nursing program Regarding Covid-19 among Pregnant Women" showed that nearly three quarters (73.3%) of the studied women have positive attitude regarding COVID-19 versus half of the studied women (55 %), also total attitude score regarding COVID-19 were improved after implementation than pre-implementation of the program. This result emphasizes the importance of educational program in enhancing the women to change their attitude positively.

In relation to part (V): reported practices (Precautionary measures) the result of present study clarified that mean score of studied pregnant women' reported practices regarding Novel Covid-19 as a total practice was improved from pre-intervention to post-intervention. The present findings agreed with

Besho et al., (2021) in Ethiopia who studied "Knowledge, Attitude and Practice Toward Corona virus Infection Among Pregnant Women Attending Antenatal Care at Public Hospitals in Three Wollega Zones" showed that more than half of the study participants had poor practice about COVID-19 infection. Increasingly, **Ayele et al., (2021)** revealed that most of the participants had inappropriate practice. The similarity in the result ensures the importance of educational program to acquire pregnant women healthy practices to prevent spread of covid-19 infection.

Concerning part (VI) correlation between total knowledge, attitude and reported practices score of the studied sample regarding Novel Covid-19; the present study finding clarified that there was positive highly statistical significant correlation between total knowledge (and total attitudes and total reported practices) at pre-intervention and post-intervention. This correlation might be explained by a "reasoned action theory". This theory states that a person's intention to undertake a specific behavior is a function of their knowledge and attitude towards that behavior **Hoque et al., (2021).**

The present finding supported by **Alahdala et al., (2020)** in Riyadh, Saudi Arabia who studied" An analytical study on the awareness, attitude and practice during the COVID-19 pandemic" who revealed that there was significant positive correlation between awareness-attitude ($r = 0.132$, p-value < 0.001) and attitude-practices ($r = 0.149$, p-value < 0.001).

Conclusion:

The precautionary measures program was an effective method to enhance pregnant women's knowledge, having positive attitudes and acquiring healthy practices regarding

novel covid-19 with highly statistical significant difference between the results of pre-intervention and post-intervention phase in favor of post- intervention phase. Moreover, there was a highly significant statistical positive correlation between total knowledge and (total reported practices & total attitude) regarding novel covid-19 at pre-intervention and post-intervention. The above-mentioned findings supported the present study hypotheses.

Recommendations:

- Developing awareness program regarding global standards precaution for covid-19 to enhance knowledge, acquire positive attitudes and promote healthy practices for pregnant women**.**
- Provide and distribute booklets, posters and brochures in antenatal clinics in all maternity health centers.

Further study needed to be performed:

- Following the participants after labor to ensure that there weren't complication for women after program application.
- Further researches for replication the present study in large sample size in different setting for generalization the findings.
- Integrating precautionary measures strategies in the curriculum of nursing students to be fully prepared to deal and fight other sudden emergency pandemics.

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تأثير برنامج التدابير الاحترازية على معلومات واتجاهات وممارسات السيدات الحوامل تجاه كوفيد-19 المستجد

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تحظى السيدات الحوامل كمجموعة خاصة بين الفئات الأكثر عرضة في تفشي كوفيد -19 بإهتمامًا كبيرًا وذلك بسبب التغيرات الفسيولوجية التى تحدث لهن في الجهاز التنفسي، الدوري، الغدى، الجهاز الهضمي والجهاز المناعى أثناء الحمل والتي تجعلهن أكثر عرضة للإصابة بالفيروسات. لذلك هدفت الدراسة الحالية إلى تقييم تأثير برنامج التدابير الإحترازية على معلومات وإتجاهات وممارسات السيدات الحوامل تجاه كوفيد-19 المستجد. وقد أجريت الدراسة في العيادات الخارجية لأمراض النساء والتوليد التابعة لمستشفيات جامعة بنها. أجريت دراسة شبه تجريبية على عينة غرضية من النساء الحوامل (ن = 120). وقد كشفت النتائج أن برنامج التدابير الإحترازية كان وسيلة فعالة لتعزيز معلومات السيدات الحوامل، تكوين إتجاهات إيجابية و إكتساب ممارسات صحية فيما يتعلق بفيروس كوفيد -19 المستجد. كما أوصت الدراسة الحالية بتطويربرنامج توعية بشأن الإحتياطات المعيارية العالمية لفيروس كوفيد -19 المستجد لتعزيز المعرفة وإكتساب الإتجاهات الإيجابية وتعزيز الممارسات الصحية للنساء الحوامل.