Impact of Psycho-Educational Nursing Intervention about Covid-19: on the Pregnant Woman's Knowledge, Anxiety, Depression, and Protective Practices

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Abstract

Background: Covid-19 is a new viral disease that has caused a pandemic in the world. Due to the shortage of specific definitive vaccines and treatments, protective behaviors became a vital way to overcome the disease. As a special category, pregnant women need more attention. **Aim**: To determine the impact of psycho-educational nursing intervention about Covid-19 on knowledge, anxiety, depression levels, and protective practices among pregnant women. **Subjects and Method: Study Design:** A quasi-experimental (pre-post) design used. Subjects: convenient sample of (243) pregnant women admitted for antenatal care from Kelby and Bahary health care centers in Shebin Elkom district-Menoufia Governorate-Egypt from September to December 2020. **Tools:** Two tools were utilized for data collection: Structure Interview Schedule and Hospital Anxiety Depression Scale. The period of implementation was (3) months, the implementation was passed into three phases (pre-assessment, implementation, and evaluation phase). **Results:** There was an association between some variables of socio-demographic characteristics and its total post-anxiety-depression and reproductive history. There was a highly statistically significant difference (P<0.000) between the total mean score of participants' anxiety and depression pre and post-test psycho-educational nursing intervention. **Conclusions:** According to the results, psycho-educational nursing intervention increased women's knowledge and significantly reduce the anxiety and depression levels during Covid-19 pandemic for pregnant women. **Recommendation:** Effective strategies targeting maternal stress, anxiety, and depression such as effective risk communication and the provision of psychological first aid may be particularly useful to prevent negative outcomes for pregnant women and their fetuses during Covid pandemic.

Keywords: Covid-19, Psychoeducation, Anxiety, Depression, Protective practices.

Introduction

The Coronavirus Disease (COVID-19) is rapidly spreading over the world, posing a threat serious to public health, particularly psychiatric health. As the global infection and death rate of COVID-19 climbs in the wave of illnesses, and a vaccine is still at least a year away, it is critical to properly treat pregnant women during this difficult time. This "new normal" should be made easier for women. This means that everyone must work together to combat the coronavirus while preserving hand washing and social distance [1]. Hope to achieve the best for patients while also looking after families, friends, and selves. Women may suffer depression and anxiety during pregnancy because of possible obstetrical complications such as fetal mortality or abnormalities. During infectious illness outbreaks, depression and anxiety levels may also rise. There is currently little research on the psychological impact of the COVID-19 epidemic, its impact on individuals' social and/or psychological elements, and the mental health of pregnant women [2].

Fear, isolation, uncertainty, and economic misery have all contributed to an upsurge in anxiety and depression in the general community during the COVID-19 pandemic. Pregnant or postpartum women are at a higher risk of acquiring depression or anxiety disorders. Pregnancy adds to the pressures during this pandemic [3,4,5]. Pregnant women are especially prone to becoming extremely ill or dying from COVID-19, according to a recent report from the Centers for Disease Control and Prevention [6]. Women's anxieties for themselves and their children are heightened because of this information.

Perinatal depression affects about 10% of pregnant women worldwide [7,8] . Perinatal depression, if left untreated, can have negative obstetric consequences, and is linked to poor maternal health, inadequate prenatal treatment, and postpartum depression [9]. Perinatal depression is linked to impaired maternal-infant bonding, increased irritability, and decreased activity, in addition to the possible detrimental influence on pregnancy outcomes. Many papers on COVID-19 have been published in the recent six months. Because pregnant women and their unborn children are at risk for COVID19, over 1000 studies have looked at the issue. A high rate of pregnancy complications was recently reported in a case series with 10 SARS-CoV-2 infected pregnant women, with 50% of them requiring an emergency cesarean section due to fetal distress

(30%), premature rupture of the membrane (10%), and stillbirth (10%), despite the severity of COVID-19 in most of these patients being mild to moderate, with only one developing severe pneumonia, indicating that preventive measures should be taken [3].

During COVID-19, Ifdil et al. (2020) [10] emphasized the importance of treating depression and psychological distress in pregnant and postpartum women. They underlined how pregnant women who were denied access to health treatments during the Covid-19 outbreak faced psychological distress and had a higher risk of maternal death. Although the availability of health care and pregnancy outcomes differs by country, data suggests that COVID-19 causes substantial levels of psychological stress in pregnant women. It claims that to control the physical and psychological effects of COVID-19 during pregnancy, a collaboration between medical and psychological professionals is required.

Women's mental health might be harmed by a lack of proper domestic and emotional care. Women are also at a higher risk of anxiety, depression, and post-traumatic stress disorder (PTSD) [11,12] .According to Mrs. Phumzile Mlambo-Ngcuka, Executive Director of the United Nations (UN) Women, the Covid-19 pandemic is more than a health issue; it is a profound shock to our societies, exposing the flaws in public and private arrangements that currently work only if women play multiple and underpaid roles. This is an opportunity for governments to acknowledge both the magnitude of women's contribution and the precocity of many of them[11]. Pregnant women have always been seen as a high-risk group. Mental problems such as anxiety and depression are more common during perinatal periods in low- and middle-income nations than during non-pregnancy times, according to the systematic reviews [8].

Pregnant women's reality interacts with a series of inequalities, affecting a population that is particularly vulnerable to the pandemic's side effects. Pregnancy is an additional risk factor for the emergence of psychological discomfort, the development of some psychopathological diseases, and an increase in severity as the pandemic progresses. In this context, a thorough and exact evaluation of pregnant women will be a crucial input for the following design, planning, and implementation of health policies with the main goal of preventing and counteracting harmful effects on

mothers' and children's mental and psychological health [13,14].

Many pieces of research on the link between maternal mental health and COVID-19 have also been reported. Increased symptoms of anxiety and depression and lower quality of mental life [9, 3, 15- 18] increased perceived levels of distress [13] and mild psychological impact owing to isolation [14] have all been observed in these investigations among pregnant women.

According to a prior study, contracting an infection at a young gestational age may result in a poor or negative pregnancy outcome for the mother and fetus. Although the psychological health and mental condition of the pregnant women were not reported in this research, psychological health problems including anxiety, depression, and stress have been linked to preterm birth and low birth weight. Furthermore, a combination of viral infections and poor mental health could have bad or catastrophic consequences for maternal and newborn health. So, during this pandemic, pregnant women need great emotional support to prevent maternal and neonatal complications [19, 20].

During this epidemic, health care practitioners must be mindful of the additional psychological difficulties that pregnant and postpartum women face. Although more telemedicine visits during pregnancy and postpartum make screening more difficult, the increased risk of mental health symptoms during the pandemic highlights the need for expanded efforts to screen women for mental health concerns during pregnancy and the postpartum period. It's critical that kids have access to supportive care and, if necessary, medication. To alleviate irrational fears, health care providers must have current information on COVID-19's effects on pregnancy, infants, and breastfeeding. This study is critical for all the following to prevent and treat depression, anxiety, and stress caused by Covid -19, as well as to follow the safety precautions to avoid Covid- 19 infection during pregnancy [18].

Significance of the study:

Because of the physiologic and immunologic changes that occur during pregnancy, pregnant women are thought to be more prone to developing severe cases or death from COVID-19 infection than the public [21-23]. Additionally, the presence of comorbidities, a high body mass index (BMI), and a greater maternal age are all considered risk factors for a more severe

infection during pregnancy [21,24]. Preventing COVID-19 infection in pregnant women is particularly very important and crucial. In the prevention of infectious diseases such as COVID-19, knowledge and attitude are a critical issue. Inadequate information may result in a delay in diagnosing this highly contagious condition, as well as diseases transmission due to poor infection control procedures [25] .

A study carried out in Spain by Romero-Gonzalez et al.(2020) [26] has shown that perceived stress, specific pregnancy stress, as well as insomnia are predictive variables in most anxiety and depressive symptoms related to COVID-19 in pregnant women. However, The World Health Organization has recommended preventive/safety measures such as frequent hand washing with soap and water, physical/social distancing, wearing a face mask in public, covering the mouth while coughing, and avoiding touching the eyes, nose, and mouth to prevent the spread of COVID-19 infection [22, 27]. So, this study is very important to design a psycho-educational nursing intervention about Covid-19 for pregnant women to enhance their knowledge, protective practices, and reduce anxiety& depression levels among them.

A study done by Hong Jiang et al. 2020 [28] concluded that during the COVID-19 epidemic occurrence of experiencing perceived stress, anxiety, and depression is high among pregnant women. Mental health care is urgently needed to reassure and support pregnant women during this duration. Developing specific content for pregnant women on how to cope in emergency situations and major diseases outbreak via special programs could be an effective way to mitigate mental health disorders in epidemic preparedness and response.

The previous research findings suggest that acquiring infection at an early gestational age might lead to worse or negative pregnancy outcomes. Although these studies did not report the psychological health and mental state of pregnant women. Psychological health problems especially anxiety, depression, and stress of pregnant women have been associated with preterm birth including low birth weight. Furthermore, an interplay between viral infections with poor psychological health may have negative or fatal effects on maternal and neonatal health. So, during this pandemic, pregnant women need great emotional support to prevent maternal and neonatal complications [19, 20].

Aim of the Study

To investigate the impact of psycho-educational nursing intervention about Covid-19 on the pregnant women's knowledge, anxiety and depression levels, and protective practices

Hypotheses of the study:

-Women's knowledge regarding Covid-19 will be significantly higher post- psycho-educational nursing intervention rather than pre-intervention.

-Women's anxiety and depression mean scores will be significantly lowered post-psycho-educational nursing intervention than pre-intervention.

-The psycho-educational nursing intervention will help in changing the false beliefs and enhance protective health practices for Covid-19 among pregnant women.

Study question

At the end of the study, the researchers will answer the following question:

What is the impact of psycho-educational nursing intervention on pregnant woman's knowledge, anxiety, depression, and protective practices about Covid-19?

Subjects and Method

Research Design:

A quasi-experimental research (pretest, posttest) design was utilized to achieve the aim of this study.

Subjects:

Sample size was calculated at where sample size by Steven K. Thompson, 2012 [29] used to calculate sample size according to this formula: $n = \dfrac{Np(1-p)}{[(N-1)(d^2 \div z^2)] + p(1-p)}$

N: population size.

n: sample size.

Z: conference level at 95% (1.96).

d: error level (0.05)

P: probability (50%)

According to the above-mentioned equation, the sample will include a convenient sample of participants of women volunteers was selected according to their responses in scales. The total number of samples (sample size) will be (243) women. (135) from the urban areas and (108) from the rural areas.

Criteria for inclusion were read and write ability for women, outpatient clinic, participants were not undergoing any psychiatric management, and participants agree to participate in the study.

Exclusion criteria were illiterate women, women who has a history of psychiatric disorders, and women who refuse to participate in the study.

Research Setting:

The study was conducted at Kebly and Bahary Maternal& Child Health Care Centers in Shebin Elkom at Menoufia Governorate, Egypt. These setting was selected for women's continuation of these centers. Health Care Centers consist of clinics for children, gynecologic, family planning methods, pregnancy follow-up, dentists, and analysis. Also, a hall to explain for health education

Tools for data collection: Two tools were utilized by the researchers for data collection.

Structure Interview Schedule: This tool was developed by the researchers after reviewing the related literature and it is divided into four parts: a) Socio-demographic data for the purpose of collecting socio-demographic characteristics which include age, gender, residence, educational level, and type of occupation. b) History of previous pregnancies and deliveries: to collect data about numbers of pregnancies, deliveries, and history of abortion and its causes if occurred. c) Maternal complications for previous pregnancies and deliveries such as anemia, pregnancy-induced hypertension, preterm labor, and postpartum hemorrhage. d) Knowledge and protective practices of pregnant women related to the COVID-19 pandemic such as methods of the virus transmission, methods of the protective practices (frequent hand washing, masking, and keeping social distance), and the healthy food that increase body immunity.

Hospital Anxiety Depression Scale (HADS): Developed by Zigmond et al. 1983 [30]**.** The HADS is a fourteen-item scale that generates ordinal data. Seven of the items related to anxiety and seven related to depression. Each item on the questionnaire is scored from 0-3 and this means that a person can score between 0 and 21 for either anxiety or depression. Therefore, **the score** is between (0 and 21) for either anxiety or depression: 0–7 is normal, 8–10 is borderline abnormal, and 11–21 is abnormal. This tool was translated into Arabic, validated, and tested for reliability in 2017 by Terkawi et al. 2017 [31]

Ethical consideration

Written approval was obtained by the researchers from responsible authorities after explaining the purpose of the study.

The researchers introduced themselves to every participant and explain the purpose of the study and assured them that confidentiality would be maintained throughout the study if the participant needs it. Also, the researchers emphasized that participation in the study is entirely voluntary and withdrawal from it can be done at any time, then informed consent was obtained from the participants who accepted to participate in the study.

Validity and reliability

The first tool was constructed by the researchers after reviewing the relevant literature. Tool II HADS revised Arabic translation by the researchers then was tested for content validity by 5 experts in nursing and medical psychiatric and obstetric fields. Modifications were done according to ascertain relevance and completeness. This tool was tested using a test-retest methods and a Pearson correlation coefficient formula was used. It was (r. = 0.7 56) for the tool.

Pilot study

Prior to the actual study, a pilot study was conducted on 10% of the study sample (20 volunteers) to test the feasibility and applicability of the tools and then necessary modifications were carried out accordingly. Data obtained

from the pilot study were not included in the current study.

Data collection

The study was carried out in the period from September to December 2020. The researcher collected the data during the morning four days/week from 10 am to 1.30 pm with by taking all the precautionary measures for COVID19 considering the social distance and protective masking. Each group of them consisted of 20 pregnant women. The period of implementation was 3 months. The implementation of the study was passed into three phases (pre-assessment phase, implementation phase, and evaluation phase).

Pre-assessment phase:

A comfortable and private place was chosen for interventions in the health centers. Orientation was done about researchers' names, purposes, and content of the study. Subjects interviewed individually at their rooms where pre-assessment was done using a demographic questionnaire, and Hospital Anxiety Depression Scale. Implementation phase, the researchers divided the participants randomly into 12 sub-groups. Every sub-group was 20 women, every group attended (10) intervention sessions every session takes

one hour within two days/week from 10 AM to 11.30 AM and from 12 PM to 1.30 PM. (two groups per day). The period of implementation was 10 weeks for each group. This was achieved through several teaching methods such as lecture, discussion, and providing examples. Videos, booklets, and pictures were used as media. At the end of each session, a summary, feedback, further clarification, and homework assignment were given.

The implementation phase:

This was applied by the researchers through introducing the psycho-educational intervention.

Psycho-Educational Nursing Intervention:

The general aim of the Psycho-educational intervention for management about COVID19 was to enhance knowledge and health practices of pregnant women regarding their readiness. The intervention took about 3 months from the beginning of September to December 2020, two sessions per week for each group. At the end of the nursing intervention, 15 minutes were allotted for a discussion and feedback. In answering these questions discussing psychological issues can be embarrassing for both the researchers and the women. They often carry the feeling of failure or that they are abnormal. The researchers anticipate the embarrassment of women and acknowledge that it could be difficult talking about such issues. For example, the clinician may say, "Most people find it difficult to talk about these things and may feel a bit embarrassed. I'd just like to reassure you that everything you say is confidential and that I'd like to help you if I can. The first step is to find out exactly what is going on so that we can figure out how to make things right again. Please feel free to be open with me and to ask questions.

The sessions of the Psycho-educational Intervention:

Session one: was carried out by the researchers for orienting pregnant women about the benefits of psycho-educational intervention, collecting baseline socio-demographic data, and giving pre-test questionnaires

Session two and three: These sessions include the knowledge about COVID19: Information about how to overcome an accident or a crisis and give support. Where raised levels of anxiety or depression may occur in COVID-19 pregnant women and their families, ensure they access the psychosocial care and support they need during their rehabilitation process.**Session four:** This

session aimed to help the pregnant women identify their emotions, and the feelings of others through providing the women with information about emotional regulation; definition, how to deal with emotions efficiently, identify the causes of emotions, avoiding or changing the causes of emotions, how to deal with emotions that can't be avoided.

Session five and sex: These sessions aimed to help the women to manage fetal and uterine contraction monitoring based on gestational age, when appropriate, Individualized delivery planning, A multispecialty, team-based approach that may include consultation with obstetric, maternal-fetal medicine, infectious disease, pulmonary-critical care, and pediatric specialists, as appropriate. In general, the therapeutic management of pregnant patients with COVID-19 should be the same as for non-pregnant patients. The COVID-19 Treatment Guidelines Panel recommends against withholding treatment for COVID-19 vaccination from pregnant or lactating individuals because of theoretical safety concerns.

Session seven and eight: These sessions aimed to improve pregnant women's mental health and reduce anxiety and depression related to

COVID19 and find opportunities to amplify positive and hopeful stories and positive images of local people who have experienced COVID-19. For example, stories of people who have recovered or who have supported a loved one and are willing to share their experience. Take care of yourself at this time. Ensure that good quality communication and accurate information updates are provided to pregnant women. Ensure that pregnant women are aware of where and how they can access mental health and psychosocial support services and facilitate access to such services. Minimize watching, reading, or listening to news about COVID-19 that causes you to feel anxious or distressed; seek information only from trusted sources and mainly so that you can take practical steps to prepare your plans and protect yourself and loved ones. Seek information updates at specific times during the day, once or twice. The sudden and near-constant stream of news reports about an outbreak can cause anyone to feel worried. Get the facts; not rumors and misinformation. Facts can help to minimize fears.

Session nine and ten: These sessions aimed to help the women apply several

therapies for decreasing anxiety and depression from COVID19 through coping strategies: Eat well-balanced meals: Do not skip any meals. Do keep healthful, energy-boosting snacks on hand.   Limit caffeine, which can aggravate anxiety and trigger panic attacks. Get enough sleep: When stressed, your body needs additional sleep and rest. Exercise daily: To help you feel good and maintain your health. Check out the fitness tips below. Take a time-out: Practice yoga, listen to music, meditate, get a massage, or learn relaxation techniques. Stepping back from the problem helps clear your head. Take deep breaths: Inhale and exhale slowly. Count to 10 slowly: Repeat, and count to 20 if necessary. Deep breathing: Is another calming skill you can use when you are in a stressful situation. Find forms of exercise: That are fun or enjoyable. Extroverted people often like classes and group activities. People who are more introverted often prefer solo pursuits. Distract yourself: With other portable media player to download audiobooks or music. Many people find it's more fun to exercise while listening to something they enjoy.

III Evaluation phase:

The last phase in which the researchers assess the achievement of the aim of the study through reintroducing the research tool (Hospital Anxiety Depression Scale), post-test for pregnant women to assess the effectiveness of the program. The program evaluation tool was developed by the researcher and introduced to the study group to evaluate the program itself.

Statistical analysis

Data were collected, tabulated, statistically analyzed using an IBM personal computer with Statistical Package for Social Science (SPSS) version 25 (SPSS, Inc, Chicago, Illinois, USA), where the following statistics were applied: **Descriptive statistics:** in which quantitative data were presented in the form numbers and percentages. **Analytical statistics:** used to find out the possible association between studied factors and the targeted disease, the used tests of significance included: **A) Reliability analysis Cronbach's Alpha:** was used to measure validity and reliability of the questionnaire which was greater than 70%, so we can say that its results can be taken. **B) Kolmogorov-Smirnov test:** was used to determine if the data

was normally distributed or not. **C) Chi-Square (X^2) test (nonparametric test):** was used to know if there was an association between two categorical variables or not, which were not normally distributed. **D) Fisher's Exact test (non-parametric test):** also, was used to know if there was an association between two categorical variables or not but here categorical must be 2*2 just like these variables (Residence and occupation) which were not normally distributed. **E) Spearman Rank-correlation coefficient (ρ):** was used to measure the strength and direction of the association. Thus, their correlation with each other was existed or not, which means if one of them changes the other must be change. If P-value was higher than the level of significance (α = 0.05) considered that the test was statistically non-significant. If P-value was lower than or equal the level of significance (α = 0.05) considered that the test was statistically significant.

Results

Table (1): There was an association between residence (Urban, Rural) and its socio-demographic characteristics, history of pregnancy, previous births,

previous pregnancy, and childbirth complications of the study group, where the P-value was equal to zero less than the level of significance α = 0.005. Highly significant difference among the age group, the larger percent (55.6%, 41.7%) respectively were urban and rural university-educated women . Highly significant difference regarding educational level. The larger percent were worked women. In relation to the history of pregnancy and previous birth among urban women were 40% first pregnancy while among rural women 50% were second pregnancy. 20% of urban women had a history of abortion.

Table (2): There was an association between the total score of pre-anxiety depression and its socio-demographic characteristics and reproductive history of the study group, where the P-value was equal to zero less than the level of significance α = 0.005. A highly significant difference was found among the age group, residence, education level, occupation, history of pregnancy, and previous birth of women regarding pre-anxiety and depression levels.

Table (3): There was an association between some variables of socio-demographic characteristics and the total post-anxiety-depression and

reproductive history where the P-value was less than the level of significance (α=0.05) which means the tests were statistically significant. In relation to age (22.2%) have severe anxiety and depression 50% respectively at age 20-25 years and 31-35 years. In relation to residence (22-21%) of have severe anxiety and depression. A highly significant difference was found among the age group, residence, education level, occupation, history of pregnancy, and previous birth of women during post-anxiety and depression levels.

Table (4): This table showed the test of rank correlation coefficient was not significant where the (P-value) was equal to 0.316 bigger than level of significance (α = 0.05) which means there was no powerful relation between these two variables so, there was no correlation between them where the (ρ = 0.065). This means all the participants were achievement the aim of study well and the psycho-educational nursing intervention was very effective.

Figure (1): This figure refers to there was no correlation between responses of the sample before and after the intervention, which means the program was succeeded in its purpose that we made for it.

Table (5): This table showed the relationship between COVID19 information and socio-demographic characteristics (pre-intervention) among pregnant women. There was a highly statistically significant difference (P<0.000) in relation to women's age, educational levels, and residence.

Table (6): This table showed the relationship between healthy practices of COVID19 and socio-demographic characteristics (pre-intervention) among women. There was a highly statistically significant difference (P<0.000) in relation to women's age, educational levels, and residence.

Table (7): This table showed the comparison between the total mean scores of participants' pre and post-information about COVID19 and anxiety-depression levels. There was a highly statistically significant difference (P<0.000) between the total mean scores of participants' pre and post-test.

Table (8): This table showed the relationship between the importance of healthy nutrition to increase immunity and socio-demographic characteristics (post-intervention) among women. There was a highly statistically significant difference (P<0.000) in relation to women's age, educational levels, and residence

Table (1): Socio-demographic characteristics of the study group

Socio demographic characters	Residence N=243				P-value (X^2)
	Urban N = 135		Rural N =108		
	No.	%	No.	%	
1. Personal data					
Age / years					
< 20	18	13.3	15	13.9	
20 – 25	27	20	27	25	
26 – 30	15	11.1	33	30.6	0.000
31 – 35	27	20	0	0	Sig.
36 – 40	30	22.2	30	27.8	
> 50	18	13.3	3	2.8	
Educational level					
Read & write	3	2.2	33	30.6	
Secondary	54	40	15	13.9	0.000
University	75	55.6	45	41.7	Sig.
Postgraduate	3	2.2	15	13.9	
Occupation					
Work	81	60	81	75	0.014
Not work	54	40	27	25	Sig.
Spouse's education level					
Secondary	57	42.2	54	50	0.000
University	51	37.8	54	50	Sig.
Postgraduate	27	20	0	0	
Spouse work					
Worker	12	8.9	0	0	0.000
Employee	21	15.6	27	25	Sig.
Teacher	27	20	0	0	
Special business	75	55.6	81	75	
2. History of pregnancy and previous births					
No. of pregnancy					
1st	54	40	27	25	0.000
2nd	27	20	54	50	Sig.
3rd	27	20	27	25	
4th	27	20	0	0	
No. of births					
1st	54	40	54	50	0.000
2nd	27	20	54	50	Sig.
3rd	54	40	0	0	
No. of abortion					

Non 1st	108 27	80 20	108 0	100 0	0.000 Sig.
Causes of abortion Non **Repeat pregnancy without spaces.**	108 27	80 20	108 0	100 0	0.000 Sig.
3. Previous pregnancy and childbirth complications					
During pregnancy Non **Abortion** **Anemia**	81 27 27	60 20 20	54 0 54	50 0 50	0.000 Sig.
During childbirth Non **Premature birth** **Postpartum birth**	81 27 27	60 20 20	81 27 0	75 25 0	0.000 Sig.
After childbirth Non **The uterus does not return to its normal size.** **Having a rupture uterus.**	108 27 0	80 20 0	81 0 27	75 0 25	 0.000 Sig.

Statistically Significant at p ≤ 0.05

Table (2): Relationship between total score of pre-anxiety and depression, socio-demographic characteristics, and reproductive history of the study group

Socio demographic characters	Total score of pre-anxiety and depression								P-value
	No N = 27		Mild N = 81		Moderate N = 81		Severe N = 54		
	No.	%	No.	%	No.	%	No.	%	
1. Personal data									
Age / years									
< 20	6	22.2	21	25.9	6	7.4	0	0	
20 – 25	0	0	0	0	27	33.3	27	50	
26 – 30	9	33.3	30	37	9	11.1	0	0	0.000
31 – 35	0	0	0	0	0	0	27	50	Sig.
36 – 40	12	44.4	24	29.6	24	29.6	0	0	
> 50	0	0	6	7.4	15	7.4	0	0	
Residence									
Rural	27	100	54	66.7	27	33.3	0	0	0.000
Urban	0	0	27	33.3	54	66.7	54	100	Sig.
Educational level									
Read & write	3	11.1	3	3.7	30	37	0	0	
Secondary	6	22.2	27	33.3	33	40.7	3	5.6	0.000
University	6	22.2	48	59.3	18	22.2	48	88.9	Sig.
Postgraduate	12	44.4	3	3.7	0	0	3	5.6	
Occupation									
Work	27	100	81	100	27	33.3	27	50	0.000
Not work	0	0	0	0	54	66.7	27	50	Sig.
Spouse's education level									
Secondary	27	100	3	3.7	54	66.7	27	50	0.000
University	0	0	78	96.3	0	0	27	50	Sig.
Postgraduate	0	0	0	0	27	33.3	0	0	
Spouse work									
Worker	0	0	3	3.7	6	7.4	3	5.6	
Employee	0	0	27	33.3	21	25.92	0	0	0.000
Teacher	0	0	0	0	27	33.3	0	0	Sig.
Special business	27	100	51	62.96	27	33.3	51	94.4	
2. History of pregnancy and previous births									
No. of pregnancy									
1st	0	0	54	66.7	0	0	27	50	
2nd	0	0	27	33.3	54	66.7	0	0	0.000
3rd	27	100	0	0	0	0	27	50	Sig.
4th	0	0	0	0	27	33.3	0	0	
No. of births									0.000
1st	0	0	81	100	0	0	27	50	Sig.

2nd 3rd	27 0	100 0	0 0	0 0	54 27	66.7 33.3	0 27	0 50	
No. of abortion No 1st	27 0	100 0	81 0	100 0	54 27	66.7 33.3	54 0	100 0	0.000 Sig.
Causes of abortion Non Repeat pregnancy without spaces	27 0	100 0	81 0	100 0	54 27	66.7 33.3	54 0	100 0	0.000 Sig.
3. Previous pregnancy and childbirth complications									
During pregnancy Non Abortion Anemia	27 0 0	100 0 0	27 0 54	33.3 0 66.7	54 27 0	66.7 33.3 0	27 0 27	50 0 50	0.000 Sig.
During childbirth Non Premature birth Postpartum birth	27 0 0	100 0 0	54 27 0	66.7 33.3 0	54 0 27	66.7 0 33.3	27 27 0	50 50 0	0.000 Sig.
After childbirth Non. The uterus does not return to its normal size. Having a rupture uterus.	27 0 0	100 0 0	54 0 27	66.7 0 33.3	81 0 0	100 0 0	27 27 0	50 50 0	0.000 Sig.

Statistically Significant at p ≤ 0.05

Table (3): Relationship between total post anxiety and depression, socio-demographic characteristics, and reproductive history of the study group

	Total post-anxiety and depression				P-value
	No N = 120		Mild N = 123		
	No.	%	No.	%	
1. Personal data					
Age / years					
< 20	9	7.5	24	19.5	
20 – 25	15	12.5	39	31.7	0.000
26 – 30	30	25	18	14.6	Sig.
31 – 35	24	20	3	2.4	
36 – 40	30	25	30	24.3	
> 50	12	10	9	7.3	
Residence					0.368
Rural	57	47.5	51	41.4	FE
Urban	63	52.5	72	58.5	Not sig.
Educational level					
Read & write	18	15	18	14.6	0.407
Secondary	36	30	33	26.8	Not Sig.
University	57	47.5	63	51.2	
Postgraduate	9	7.5	9	7.3	
Occupation					0.177
Work	75	62.5	87	70.7	FE
Not work	45	37.5	36	29.3	Not sig.
Spouse's education level					
Secondary	57	47.5	54	43.9	0.209
University	54	45	51	41.5	Not sig.
Postgraduate	9	7.5	18	14.6	
Spouse work					
Worker	6	5	6	4.9	
Employee	18	15	30	24.3	0.045
Teacher	9	7.5	18	14.6	Sig.
Special business	87	72.5	69	56.1	
2. History of pregnancy and previous births					
No. of pregnancy					
1st	48	40	33	26.8	0.003
2nd	30	25	51	41.5	Sig.
3rd	33	27.5	21	17.1	
4th	9	7.5	18	14.6	
No. of births					
1st	57	47.5	51	41.5	0.015
2nd	30	25	51	41.5	Sig.
3rd	33	27.5	21	17.1	
No. of abortion					0.102
Non	111	92.5	105	85.4	FE

1st	9	7.5	18	14.6	Not sig.
Causes of abortion **Non**	111	92.5	105	85.4	0.102 FE
Repeat pregnancy without spaces	9	7.5	18	14.6	Not sig.
3. Previous pregnancy and childbirth complications					
During pregnancy **Non** **Abortion** **Anemia**	51 9 60	42.5 7.5 50	84 18 21	68.3 14.6 17.1	0.000 Sig.
During childbirth **Non** **Premature birth** **Postpartum birth**	78 33 9	65 27.5 7.5	84 21 18	68.3 17.1 14.6	0.054 Not sig.
After childbirth **Non**	87	72.5	102	82.9	
The uterus does not return to its normal size.	24	20	3	2.4	0.000 Sig.
Having a rupture uterus.	9	7.5	18	14.6	

FE: is Fisher's exact test

Statistically Significant at p ≤ 0.05

Table (4): Correlation between the total scores of pre and post anxiety and depression levels

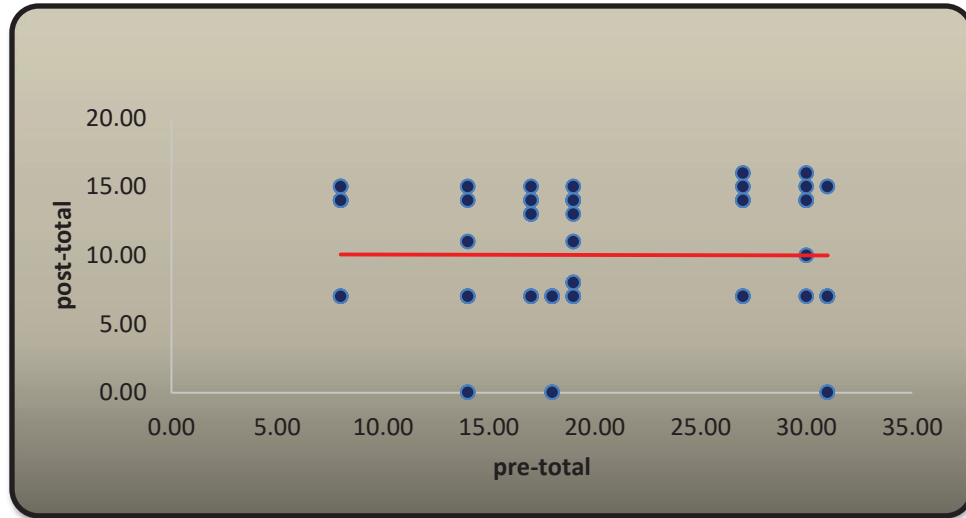| Variable	P	P-value
Total scores of pre-anxiety and depression levels	0.065	0.316 Not sig.
Total scores of post-anxiety and depression levels		

Spearman correlation coefficient (ρ)

Figure (1): Correlation between pre and post psych-educational intervention among women

Table (5): Relationship between COVID19 information in study cases and socio demographic characters pre intervention

Socio demographic characters	Total score of coronavirus information N=243				P-value (X^2)
	Incomplete answer N = 216		Full answer N = 27		
	No.	%	No.	%	
Age / years					
< 20	33	15.3	0	0	
20 – 25	27	12.5	27	100	
26 – 30	48	22.2	0	0	0.000
31 – 35	27	12.5	0	0	Sig.
36 – 40	60	27.8	0	0	
> 50	21	9.7	0	0	
Educational level					
Read & write	9	4.2	27	100	0.000
Secondary	69	31.9	0	0	Sig.
University	120	55.6	0	0	
Postgraduate	18	7.3	0	0	
Residence					0.000
Rural	81	37.5	27	100	FE
Urban	135	62.5	0	0	Sig.

Statistically Significant at p ≤ 0.05

Table (6): Relationship between coronavirus preventive health practices in study cases and socio-demographic characteristics pre-intervention

Socio demographic characters	Healthy practices N=243				P-value (X^2)
	True N = 54		False N = 189		
	No.	%	No.	%	
1. Washing hands					
Age / years					
< 20	21	38.9	12	6.3	
20 – 25	0	0	54	28.6	
26 – 30	18	33.3	30	15.9	0.000
31 – 35	0	0	27	14.3	Sig.
36 – 40	12	22.2	48	25.4	
> 50	3	5.6	18	9.5	
Educational level					
Read & write	0	0	36	19.0	0.000
Secondary	18	33.3	51	27.0	Sig.
University	36	66.7	84	44.5	
Postgraduate	0	0	18	9.5	
Residence					0.357
Rural	27	50	81	42.9	FE
Urban	27	50	108	57.1	Not Sig.
2. Wearing mask 3. Removing mask					
	N = 27		N = 216		
Age / years					
< 20	9	33.3	24	11.1	
20 – 25	0	0	54	25	
26 – 30	12	44.4	36	16.7	0.000
31 – 35	0	0	27	12.5	Sig.
36 – 40	6	22.2	54	25	
> 50	0	0	21	9.7	
Educational level					
Illiterate	0	0	3	1.4	
Read & write	0	0	36	16.7	0.000
Secondary	0	0	69	31.9	Sig.
University	27	100	93	43.1	
Postgraduate	0	0	15	6.9	
Residence					0.000
Rural	27	100	81	37.5	FE
Urban	0	0	135	62.5	Sig.

Statistically Significant at p ≤ 0.05

Table (7): Comparison between total mean scores of participants' pre and post information about COVID19 protective practices, anxiety, and depression levels (n=243)

Variables	Mean ± SD Pre	Mean ± SD Post	(X^2)	P-value
Washing hand	1.333 ± 0.473	1.000 ± 0.0000	6.325	0.0000 Sig.
Wearing mask	1.235 ± 0.454	1.0114 ± 0.000	27.939	0.000 Sig.
Removing mask	1.555 ± 1.497	1.022 ± 0.000	17.393	0.000 Sig.
Nutrition during pregnancy	0.559 ± 0.497	1.000 ± 0.000	13.798	0.0000 Sig.
Anxiety	1.343 ± 0.668	0.769 ± 0.526	10.312	0.000 Sig.
Depression	2.000 ± 0.668	0.679 ± 0.467	23.554	0.0000 Sig.

Statistically Significant at $p \leq 0.05$

Table (8): Relationship between proper nutrition methods in study cases and socio-demographic characteristics post-intervention

Socio demographic characters	Proper nutrition methods N=243						P-value (X^2)
	False answer N = 27		Incomplete answer N = 27		Full answer N = 189		
	No.	%	No.	%	No.	%	
Proper nutrition to increase immunity							
Age / years							
< 20	9	33.3	0	0	24	12.7	
20 – 25	0	0	0	0	54	28.6	
26 – 30	12	44.4	3	11.1	33	17.5	0.000 Sig.
31 – 35	0	0	0	0	27	14.3	
36 – 40	6	22.2	21	77.8	33	17.5	
> 50	0	0	3	11.1	18	9.5	
Educational level							
Read & write	0	0	3	11.1	33	17.5	
Secondary	0	0	24	88.9	45	23.8	0.000 Sig.
University	27	100	0	0	93	49.2	
Postgraduate	0	0	0	0	18	8.5	
Residence							
Rural	27	100	0	0	81	42.9	0.000 Sig.
Urban	0	0	27	100	108	57.1	

Statistically Significant at $p \leq 0.05$

Discussion

COVID19 infection is a public health issue, and effective care requires widespread public awareness [32] . It has been established that proper knowledge is required for the formation of preventive beliefs, the formation of a positive attitude, and the promotion of disease-prevention practices [33]. The present study aimed to determine the impact of psycho-educational nursing intervention about covid-19 on knowledge, levels of anxiety and depression, and protective practices among pregnant women.

In this study, the most common age group was 36-40 years old. This was comparable to similar age groups of 29- 38year old with a mean age of 30.78±4.71 years reported by Boma Awoala West et al. (2021) [34] and similar age groups of 30-39 years, 31- 35 years, 30-34 years, and 18- 39 years reported by Anikwe et al (2020) [35], Omozuwa et al. (2020) [36], and Reuben et al. (2020) [37].

Concerning the level of anxiety and depression, the results of the current study related to age and level of education indicated that women who were aged 20-35 years old were at higher risk of

psychological problems than women who were aged above 35 years old. Several scholars' demons related that childbirth was a stressor, and all the pregnant women show various degrees of anxiety or depression symptoms. These results were congruent with the study of Hoque et al. (2021) [38], Okello et al. (2020) [39], and Zhong et al. (2020) [40]. In Benin, Omozuwa et al. (2020) [36] in Southern Nigeria illustrated that primigravida and young pregnant women are important risk factors for anxiety and depression during the Covid-19 pandemic.

The result revealed the higher frequency of anxiety and depression status at pre-intervention, which is like the findings of zhuh et al. (2020) [41] and Wang et al. (2020) [42], women between the ages of 18 and 30 were at a higher risk of psychological issues than women over the age of 30. It's most likely due to the lack of pregnancy experience among people of this age group. Furthermore, a lower level of education was linked to a higher prevalence of anxiety or depressive symptoms, which matches the findings of the current study. It's because people with a higher level of education are

more aware of their own safety and can actively gather essential information and knowledge about the epidemic in a variety of ways.

The level of practice of the respondents in this study varied greatly depending on the level of education and type of occupation of pregnant women and their spouses. Respondents with a post-graduate or graduate degree had a considerably higher practice score than those with only secondary education, these results are in accordance with Egbi et al. (2020) [43]. In contrast to the findings of this investigation, the study of Edet et al. (2020) [44] found that age was strongly correlated with COVID-19-related behaviors. In their study Kamal et al. (2021) [45] found a significant relationship between practice scores and age and place of residence, but Adesegun et al. (2020) [46] found no significant differences in respondents' practice levels based on age, occupation, marital status, degree of education, or place of residence. According to Edet et al. (2020) [44] marital status was not substantially associated with COVID-19 preventive knowledge and practice levels in the current study.

In the current study, there was an association between the total score of pre-anxiety depression and its socio-demographic characteristics and reproductive history of the women, above two third of the urban pregnant women suffering from moderate anxiety and depression, the majority of university educational level had severe anxiety and depression, the half of working women had severe anxiety and depression, the half of primigravida had severe anxiety and depression, one third of having a history of abortion had moderate anxiety and depression, the half of having a history of anemia and premature birth had severe anxiety and depression, these results in accordance with the study of Yanting et al. (2020) [47] , they concluded that a clinically significant increase in the prevalence of anxiety and depression symptoms after the threat of the COVID-19 epidemic especially for primigravida, working, and had a history of antenatal or postnatal complications. In the same line, in the study of Boma Awoala West et.al. (2021) [34] Anikwe et al. (2020) [35] in Nigeria, less than half of the respondents were aware that COVID-19 may be transferred to their offspring. This

information is critical to pregnant women whose that causing anxiety and depression. These results were also supported by Shaoqi Chen et al. (2020) [48] that concluded during the outbreak of COVID-19, pregnant women are prone to anxiety and depression, highlighting the necessity of further attention on those subjects. It is of vital and major significance to provide immediate psychological intervention and psychological counseling for pregnant women with poor mental health.The study results revealed that there was a highly statistically significant difference (P<0.000) between the total mean scores of participants' pre and post-test regarding protective practices, anxiety, and depression scores. Regarding the preventive health practice towards the prevention of COVID-19 in the present study showed that most pregnant women post-intervention changed the false beliefs and enhanced protective health practice for Covid-19 as frequent hand washing, admitted to wearing the face masks, and wearing the face masks all the time outside their homes in the present study after the intervention. As, Egbi et al. (2020) [43] in Bayelsa found 43.5 percent among health workers, whereas Mustapha et al.

(2020) [49] in Yobe state, Nigeria, found 35 percent among the general population. Omozuwa et al. (2020) [36] found somewhat higher rates of 58.1 percent among pregnant women in Benin. This may be the effectiveness of the psych-educational nursing intervention on the importance of wearing a face mask on a regular basis in preventing the spread of COVID-19 infection, as well as the government's free distribution of face masks. In the current study, the majority (95.7%) of respondents reported washing their hands with soap and water, however, less than half (46.9%) did so on a regular basis. In Benin, Omozuwa et al. (2020) [36] , Nigeria, and Sudan, poor hand washing practices were recorded at 45.2 percent and 56 percent, respectively. Sayehahmed et al. (2020) [50] and Habib et al. (2020) [51] Other sections by Ejeh et al. (2020) [52] and Egbi et al. (2020) [43] of Nigeria showed good regular hand washing practices of 82 percent, 87.9%, 91.1 percent, 95.3 percent, and 99 percent, respectively. In a comparable study conducted among health care professionals in Yobe State, Nigeria, 100 percent hand washing was observed. These findings were also in accordance with Chidebe et al. (2020) [53] that illustrated the

study population has good knowledge, attitude, and preventive practices of COVID-19 disease and recommended that nursing education is needed to reduce anxiety and depression during pregnancy.

The findings of this study also demonstrated that a healthy diet helps keep the body in good shape to fight the infection. Food safety management and appropriate food practices are, however, required in addition to the dietary control requirements. This finding is consistent with Moscatelli et al. (2021) [54], Butler and Barrientos (2020) [55], who found that nutrition can prevent infection and enhance illness prognosis in COVID-19 patients. Malnutrition, overweight, and obesity have all been proven to have a deleterious impact on the immune system, leading to viral infections, and various studies have demonstrated that nutritional interventions can serve as immune stimulators, preventing viral infections. Even though numerous strategies, such as the adoption of a specific eating regimen, the use of dietary supplements, and other similar interventions, show promise in the prevention, management, and recovery of COVID-19 patients.

Regarding the relation of depression, anxiety, and residence the findings of this study revealed a statistically significant difference between rural and urban areas, with urban areas experiencing less depression and anxiety because of people in urban areas having adequate knowledge about Covid- 19 infection. Also, according to Liu et al. (2020) [56] and Kajdy et al. (2020) [57], there was a substantial link between proper knowledge and levels of depression and anxiety, as well as their management. The results of the current study showed that depression and anxiety are highly significant before and after safety measures such as staying mostly indoors and going outdoors only when necessary, practicing social distancing when absolutely necessary, wearing surgical masks in public places, and adopting good hand sanitation practices to reduce the risk of community spread of covid-19, which is consistent with the findings of Liu et al. (2020) [58] that reported that Pregnant women should be properly educated on preventive measures to limit the severity of covid-19-related sickness. So, this study is very important to apply the psych-educational nursing intervention to reduce psychological effects

of covid-19 as depression and anxiety during pregnancy. On the same line, these results are supported also by the study of Ryan et al. (2020) [59] that concluded in their cross-sectional online study knowledge can better guide clinicians to communicate better with Singapore pregnant women. Also, Gabriele et al. (2020) [60] and Allagoa et al. 2020 [61] concluded that the results can be used to formulate psychological interventions to improve mental health and psychological resilience during the COVID-19 epidemic among pregnant women.

Conclusion

Based on the findings of the present study, it can be concluded that there was a highly statistically significant improvement in women's knowledge was observed and the higher positive beliefs about perceived benefits of preventive health practices, susceptibility, severity, health motivation, and reduced infection with Coronavirus during pregnancy. Effective strategies targeting maternal stress, anxiety, and depression such as effective risk communication and the provision of psychological first aid may be particularly useful to prevent negative outcomes for

pregnant women and their fetuses. Our study highlights the importance for clinicians and obstetricians to render appropriate psycho-educational intervention and focused clarification on the effect of COVID-19 among pregnant women for psychological support and mental wellbeing.

Recommendation

Based on the study findings the following recommendations are suggested:

1) Pregnant women should be encouraged to take responsibility for their own health and be active participants in the psycho-educational program.

2) More educational intervention is needed to encourage adherence to routine antenatal care with raising women's awareness about Covid-19.

3) Health professionals should provide counseling sessions for pregnant women about the protective practices of Covid-19 and stress on the psychological and emotional state of the pregnant women during this pandemic situation for early detection and management of anxiety and depression during pregnancy.

4) Applying stress management techniques and giving emotional support to pregnant women is very important during the outbreak of the Covid-19.

Strengths and Limitations of the Study

This study is the first study to investigate the impact of the psycho-educational nursing intervention on pregnant women's knowledge, anxiety and depression levels, and the protective practices during the COVID-19 outbreak. There are some challenges in the current research. First, we conducted the pre-post-test by means of online questionnaires, which may ignore those pregnant women who do not have access to the internet and took a long time. All the protective practices were considered during the intervention of the psycho-educational nursing program. Secondly, the limitation of the regions involved may cause information bias.

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