

## Effect of Cognitive Behavioral Therapy on Stress and Depression among Pregnant Women with Preeclampsia

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### Abstract

**Background:** Preeclampsia is a serious complication during pregnancy that affects not only the physical health of the mother and fetus but also the mother's mental health, including stress and depression, which has an impact on her social and community role. **Purpose:** to investigate the effect of cognitive behavioral therapy on stress and depression among pregnant women with preeclampsia. **Design:** quasi-experimental, nonequivalent control group (pre- and post-test) design. **Sample:** A purposeful sample consisting of 70 pregnant women was taken in the following settings: antenatal clinics and high-risk pregnancy department of obstetrics and gynecology hospitals affiliated with Cairo University hospitals. **Tools:** Four tools were used: a sociodemographic data questionnaire, the perceived stress scale, the Beck Depression Scale, and knowledge regarding preeclampsia. **Results:** At the pretest, there were no statistical differences between the study and control groups in relation to stress level and depression level. But, at the posttest, there were highly statistically significant differences in stress level and depression level among the study and control groups ( $p = 0.001$  and  $0.001$ ), respectively. **Conclusions:** The cognitive behavioral therapy program had a positive effect on reducing depression and stress among pregnant women with preeclampsia. **Recommendation:** A continuous training program for nurses at a maternity hospital about how to apply cognitive behavioral therapy (CBT) for pregnant women with preeclampsia, stressing that the cooperation between obstetrician and psychiatric experts can help to improve favorable conditions in women during pregnancy.

**Keywords:** Cognitive Behavioral Therapy, Stress, Depression, Pregnant Women with Preeclampsia

### Introduction

Pregnancy has many changes in a woman's body, mind, and social activities that can have negative consequences on her life and the lives of her family members. Being pregnant is a joyful and rewarding experience for many women, but for some women, it can also be stressful at times. Pregnant women's bodies are under a lot of physical and psychological strain. One of these pressures and a crucial obstetrical concern is preeclampsia (Gouda, Hassan, Kandeel, & El-Monshed, 2020).

Preeclampsia is a hypertensive disorder that is associated with pregnancy; it is defined as an onset of hypertension after 20 weeks gestation (diastolic blood pressure higher than 90 mm Hg on 2 occasions that are 4-6 hours apart or systolic blood pressure higher than 140 mm Hg) and presence of proteinuria after 20 weeks.

The pathogenesis of pre-eclampsia is only partially understood and it is related to disturbances in placentation at the beginning of pregnancy, followed by generalized inflammation and progressive endothelial damage. Risk factors for preeclampsia include obesity, chronic hypertension, diabetes, nulliparity, adolescent pregnancy and conditions leading to hyper placentation and large placentas (e.g. twin pregnancy). Preeclampsia is usually classified as mild or severe. In most settings, pre-eclampsia is classified as severe when any of the following conditions is present: severe hypertension, heavy proteinuria or substantial maternal organ dysfunction (Von Dadelszen et al, 2023).

Preeclampsia may cause complications for both the mother and the fetus, maternal complications linked to preeclampsia include a high risk of morbidity and mortality, cerebral

hemorrhage, pulmonary edema, acute renal injury, hepatic failure or rupture, and disseminated intravascular coagulation. The fetal complications may include intrauterine growth restriction and oligohydramnios due to a decrease in placental perfusion. Also, placental abruption, intrauterine hypoxia, and early delivery are the main causes of perinatal death. Due to all of these negative effects and consequences on the physical health of the mother and fetus, preeclampsia burdens the community and causes psychological issues for pregnant women, including depression and psychological stress (Abd El Halim , Farahat &Sayed, 2022) .

Stress is a complex concept that includes the assessment of coping mechanisms, personal responses, and outside events. A pregnant woman experiences psychological stress when she is unable to meet her demands, which manifests physically and behaviorally. Preeclamptic pregnant women are more vulnerable to stress. The main factor contributing to negative pregnancy and delivery outcomes is maternal stress. (Dechww, scott &Alati ,2021). Furthermore, long-term stress among preeclamptic women can lead to poor mental health, anxiety and sleep problems. Stress can escalate into depression if it is not treated immediately (Novelia , Rukmaini &Sari,2024).

The World Health Organization (WHO) describes depression as a common mental illness that is marked by lack of interest or pleasure, low self-worth or guilt feelings, changes in appetite, changes in sleep patterns, fatigue, and difficulty concentrating. In the worst circumstances, it might possibly result in suicide. Preterm birth, abortion, low birth weight, deteriorated mother-infant bonding, and an increased risk of suicide among pregnant women are just a few of the negative consequences of depression among preeclamptic women. Thus, a lot of interventions and therapies have been developed with the goal of mitigating or relieving depression and stress during pregnancy. Cognitive behavioral therapy is one of these interventions. Pregnant women can effectively lower their stress and depression with this strategy (Gonzalez et al ,2020).

Cognitive behavioral therapy (CBT) is one of the most evidence-based psychological interventions for the treatment of several psychiatric disorders. It was implemented through

regular planned sessions based on simple principles. It combines cognitive and behavioral therapies that seek to modify and change existing faulty or distorted thoughts, feelings, and behaviors with more positive and acceptable ones that will lead to the alleviation of the presenting problem (Gautam, Tripathi, Deshmukh & Duar, 2020).

Whereas, CBT entails assisting pregnant women in realizing how stress and depression - based thoughts may exacerbate their preeclamptic symptoms. CBT provides them with a heightened ability to simply observe feelings, behaviors, and experiences to disengage automatic and dysfunctional reactivity and to allow them to work and develop wiser, more balanced relationships. Therefore, CBT can have an important role to reduce stress and depression among pregnant women diagnosed with preeclampsia (Asghari, Faramarzi & Mohamadi, 2016).

The majority of preeclampsia-related deaths in Egypt were due to inadequate nursing care, inappropriate management, and delayed diagnosis. Therefore, reducing and preventing maternal and neonatal morbidity and mortality requires early detection, prompt response, accurate management, timely delivery of women with severe features of preeclampsia, and improving nurses' knowledge and skills regarding the diagnosis and management of these conditions (Joho, Kibusi, Mwampagatwa & Ernest,2020).

Nurses play a crucial role in supporting and alleviating pregnancy-related stress and depression in women with preeclampsia. This is achieved through collaboration with other healthcare teams, as well as the implementation of effective strategies aimed at addressing these issues. Such strategies include assessment and identification of pregnant women's needs, providing emotional support, offering individualized, continuous, standardized, and quality of care, ensuring privacy and confidentiality, encouraging positive adaptation with stressors, finding alternatives to solve their problems, teaching problem-solving strategies, counseling, and education by instructing them on stress management, coping strategies, and relaxation techniques (Hassan, Mourad & Mahmoud, 2021).

Furthermore, community health nurses have a vital role in improving the health status of communities by providing support and up-to-date information for pregnant women, especially those with high-risk pregnancies. Regarding the primary level of prevention, nurses should emphasize on health promotion among pregnant women by increasing their awareness about preeclampsia and the impact of stress and depression during pregnancy on pregnancy outcomes (Stanhope & Lancaster, 2018).

Numerous studies have demonstrated the effectiveness of cognitive behavioral therapy (CBT) in lowering the symptoms of anxiety, stress, and depression in pregnant women. Despite this, there is a paucity of data on the effectiveness of cognitive behavioral therapy (CBT) in reducing stress and depression symptoms in preeclamptic women. Therefore, the purpose of this study is to determine how cognitive behavioral therapy affects stress and depression in preeclamptic pregnant women.

### Significance

Every year, preeclampsia causes 500,000 fetal and 76,000 maternal fatalities worldwide. In Egypt, the prevalence of preeclampsia was 6% to 8% of all pregnancies. Furthermore, there is an increased risk of both short- and long-term mother-fetal problems, such as cerebral hemorrhage, pulmonary edema, acute renal damage, and hepatic failure. Not only preeclampsia effect on mother, but also effect on fetus, there is decrease in placental perfusion, which results in intrauterine growth restriction of the fetus, perinatal mortality, and intrauterine asphyxia and oligohydramnios (Soliman , Hasneen , AbdElmoniem & Ali ,2020).

Also, Preeclampsia in pregnant women heightens the risk of poor mental health, serving as a contributing factor to mental health issues like depression and stress. Studies have shown that pregnant women with preeclampsia have a 7% prevalence of depression and a 4.9% prevalence of stress. Depression and stress are two mental health issues that can have a detrimental effect on a woman's emotional well-being, daily functioning, and the infant health. so that, early intervention is critical for preventing or reducing the progress of poor mental health among pregnant women (Roberts et al., 2022) .

Cognitive behavioral therapy is the most widely health promotion approach used to enhance the treatment and control of preeclampsia. And prevent further psychological adverse effects, such as stress and depression, in pregnant women. To achieve this goal, supportive sessions concentrate on overcome depression and stress by some strategies (Hassan, Gouda, El-Monshed& Kandeel, 2020). Whereas, The CBT intervention assists in monitoring depression symptoms, emotion management, problem solving, stress management, interpersonal communication and support, and encouraging to engage in leisure activities and social participation (Amer et al ,2022).

It is hoped that this study returns in benefit to the practice by increasing the body of knowledge and quality of care for nurse's specialist in community health nursing, psychiatric mental health nursing and maternity nursing as regards the concepts included in the study and psychotherapeutic intervention that decrease maternal depression and stress. Additionally, the findings of this study could be utilized to develop plans for educating pregnant women diagnosed with preeclampsia about how cognitive behavioral therapy can effectively reduce stress and depression during pregnancy in order potentially lessen the negative effects of stress on women's health and community. Furthermore, the present research will fill the existing gaps in the literature in this neglected area .Finally; the finding of this study may be implemented in the future as a part of high-risk pregnancy care protocol.

### The aim of the study

This study aimed to examine the impact of cognitive behavioral therapy on levels of stress and depression experienced by pregnant women diagnosed with preeclampsia.

### The study will pursue this main objective through the following goals:

1. Assessing the levels of depression and stress experienced by pregnant women diagnosed with preeclampsia
2. Designing and implementing cognitive behavioural therapy program for pregnant women with preeclampsia.
3. Evaluating the effect of cognitive behavioural therapy program on stress and

depression level among pregnant women with preeclampsia.

**Research hypothesis**

- **H1:** Pregnant women with preeclampsia who are subjected to the cognitive-behavioral therapy program will get lower scores on the stress scale compared to those who will receive routine hospital care.
- **H2:** Pregnant women with preeclampsia who are subjected to the cognitive-behavioral therapy program will get lower scores on the depression scale than those who will receive routine hospital care.

**Operational definitions**

**Stress** is a mental health problem among women during pregnancy, an imbalance that a pregnant woman feels when she cannot deal with demands and worries, and a risk factor for adverse effects on fetal health and development, which will be measured by the perceived stress scale.

**Depression** is a medical condition characterized by a lack of enjoyment or interest, feelings of sadness, low self-esteem or guilt, sleep disruptions, changes in appetite, fatigue, and difficulty concentrating." Depression is associated with the thinking of pregnant women about the adverse effects and complications of preeclampsia on her life and her fetus, which will be measured by the Beck Depression Scale.

**Preeclampsia** is a hypertensive disorder that begins after 20 weeks of gestation, characterized by diastolic blood pressure exceeding 90 mm Hg on two occasions 4-6 hours apart or systolic blood pressure over 140 mm Hg, along with the presence of proteinuria.

**Cognitive-behavioral therapy (CBT)** is one of the most evidence-based psychological interventions for treating various psychiatric disorders. It was conducted through regular, planned sessions based on straightforward principles. CBT integrates cognitive and behavioral approaches to modify and replace faulty or distorted thoughts, feelings, and behaviors with more positive and acceptable ones, aiming to alleviate stress and depression in pregnant women with preeclampsia.

**Theoretical Framework**

Roy's adaptation model will serve as the reference framework for this study. According to Roy's model, a person is viewed as a holistic adaptive system continually interacting with the internal and external environment. The primary task of this human system is to maintain integrity amid environmental stimuli. Roy describes the environment as "all conditions, circumstances, and influences that surround and affect the development and behavior of the person." The goal of nursing, as per this model, is to foster successful adaptation (**Roy & Andrews, 1999**).

Roy's model incorporates the concepts of input, control processes, output, and feedback. An individual or group is influenced by stimuli ("input"), which are then processed by the cognator (psychological, social) control processes, resulting in either an adaptive or maladaptive response (**Roy & Andrews, 1999**). In this study, pregnant women with preeclampsia will serve as the input. Adaptation will be facilitated through a cognitive-behavioral therapy program, representing the cognator subsystem.

The output will be measured in terms of the degree of stress and depression levels among the pregnant women with preeclampsia.



## Subjects and Methods

### Research Design

The study will utilize a quasi-experimental non-equivalent control group (pre- and post-test) design. In this design, there is a treatment group that undergoes a pre-test, receives a treatment, and then undergoes a post-test. Simultaneously, there is a non-equivalent control group that also undergoes a pre-test, does not receive the treatment, and then undergoes a post-test (Denny, Denieffe, and O'Sullivan, 2023).

### Setting

Data were collected from antenatal clinics (high risk pregnancy clinics) and the high-risk pregnancy department (Department 21) of an obstetrics and gynecology hospital affiliated with Cairo University hospitals.

### Sample

A purposeful sample of 70 pregnant women was selected based on the following inclusion criteria: 20 to 30 weeks of gestation with mild preeclampsia, and the ability to read and write. Pregnant women diagnosed with severe preeclampsia, fetal distress, or those with indications for the termination of their pregnancy, as well as those who missed two consecutive sessions, were excluded from the study. The sample size was calculated using the Pearson formula for sample size calculation.

$$n = \frac{z^2 * p * (1-p) / e^2}{1 + \frac{z^2 * p * (1-p)}{e^2 * N}}$$

Where N=600 and margin of error 10%, z=2.58 and p=0.5 and the sample size was calculated to be 70 case.

### Tools for Data Collection

Four tools were used by the research investigator to obtain the necessary data, including the following:

- **Sociodemographic Data Sheet (Appendix A):** This tool was developed by the research investigator: This tool included two parts: a) First part, which included personal characteristics such as age, marital status, occupation, residence, educational level, and income; b) Obstetric history: It

was used to collect data about para, gravida, abortion, and gestational age.

- **Perceived stress scale (PSS) (Appendix B):** This scale was developed by Cohen (1983). It was adopted from Ali et al. (2021) (Arabic version). The Perceived Stress Scale prompts participants to rate how much they felt that situations in their life over the past month were unpredictable, beyond their control, stressful, and overpowering. The Perceived Stress Scale (PSS-10) consists of 10 items, each of which the participant responds to on a 5-point scale ranging from "never" to "very often". Except for 4 items (4, 5, 7, and 8), all the items are worded negatively. To calculate the total PSS-10 score, the positively worded items are reverse-coded, and then all the item scores are summed. Higher total scores on the PSS-10 indicate higher levels of perceived stress. PSS had a range of scores between 0 and 40. The total score was divided as follows: (0–13) low perceived stress, (14–26) moderate perceived stress, and (27–40) high perceived stress.

This scale has been shown to have strong validity. This includes validity in its translation to different languages, internal consistency validity, and structural validity as confirmed through factor analysis. Additionally, the scale has demonstrated high reliability, as assessed through test-retest methods as well as having a Cronbach's alpha coefficient of 0.67, indicating good internal consistency reliability.

- **Beck Depression Scale (Appendix C):** This scale was developed by Beck et al (1961). It was translated into Arabic by Biliron, Ghazlany, Gamal, and Biliron (2021). The scale contains 21 items designed to measure depression levels. Each category describes a specific behavioral manifestation of depression and consists of a graded series of four self-evaluative statements. The statement is ranked in order and weighted to reflect the range of severity of the symptom, from neutral to maximum severity. Numerical values of zero, one, two, and three. The total scoring system ranges from 0-63. The total score was divided as follows: (0–9) no depression, (10–15), mild depression, (16–23), moderate depression, (17–

36), severe depression, and (37–63) very severe depression.

This scale has been shown to have strong validity. This includes validity in its translation to different languages, internal consistency validity, and structural validity as confirmed through factor analysis. Additionally, the scale has demonstrated high reliability, as assessed through test-retest methods as well as having a Cronbach's alpha coefficient of 0.67, indicating good internal consistency reliability.

- **Pregnant women's knowledge regarding preeclampsia (Appendix D):** This tool was developed by Reda, Mostafa, Salem, and Dwedar (2024). The tool contains five questions designed to determine the degree of pregnant women's knowledge regarding preeclampsia. Responses to each question are given using a 3-point scale: the right answer received a score of two, the incomplete answer received a score of one, and the incorrect answer received a score of zero. Each question's score was added together to provide a final score that ranged from zero to ten. Three categories were created from the overall knowledge scores: low knowledge (less than 5); acceptable knowledge (from 5 to 7); and high knowledge (more than 7).

Content validity was assured by a panel of five academic nursing professionals with expertise in women's health and midwifery nursing who evaluated and confirmed its content validity. The **reliability** value was assessed by Cronbach's alpha; it was ( $\alpha = 0.89$ ).

### Pilot study

A pilot study was conducted on 10% of the sample to clarify the questionnaire and test the clarity, feasibility, and applicability of the study tools. Data obtained from the pilot study was excluded from the main study data. Based on the pilot study results, necessary modifications were made by the research investigator before the actual study commenced.

### Ethical Considerations

Official permission to conduct the study was obtained from the ethical committee and the Faculty of Nursing at Cairo University.

Following this, official permission was granted by the director of the setting. The research investigator introduced herself to the women who met the inclusion criteria and informed them about the aim of the study to obtain their consent. All participants were informed that their participation in the study is voluntary and that they could withdraw at any time without providing a reason, and their withdrawal would not affect the care they receive. Informed written consent was obtained by the research investigator.

### Procedure

First, primary official permission was obtained from the research ethics committee of the Faculty of Nursing at Cairo University to approve the tools and the study. Then, official letters were sent to the administrative authorities of antenatal clinics and the high-risk pregnancy department (Department 21) of an obstetrics and gynecology hospital affiliated with Cairo University hospitals, to grant approval for conducting the study. Official permission was obtained from the administrative authority of the selected setting. Data was collected two days per week over a six-month period, from October 2023 to March 2024. Data collection was carried out in three steps: interviewing, implementation, and evaluation.

### Interviewing phase (pre-test phase).

During this phase, the investigator met with the pregnant women either in the antenatal clinics or in the inpatient high-risk department. After explaining the purpose of the study and obtaining written informed consent, a face-to-face interview was conducted with each participant. The questions were asked in Arabic, and the responses were recorded in the data collection tool. This process allowed for the collection of data related to socio-demographic characteristics, obstetrical history, stress and depression levels, and the women's knowledge regarding preeclampsia. The interviews were conducted in the waiting room of the antenatal clinic or in the high-risk ward (Department 21). Each interview took between 20 to 30 minutes to complete.

**Implementation phase:**

After recruiting the study group and taking the baseline data, the investigator started the cognitive behavioral therapy (CBT) program application as follows:

**Content of the Program: " Cognitive Behavioral Therapy Program (CBT)"**

The CBT program was developed by the researcher, following an evidence-based treatment model with highly specified steps. Through the CBT sessions, the pregnant women learned various skills. The program sessions were held once a week for nine weeks, with each session lasting between sixty to ninety minutes. All sessions were structured using simple and understandable Arabic language, suitable for the varying levels of understanding among the pregnant women.

Each session comprised five parts: the session title, the objectives, the agenda, assignments, and the concluding phase. The sessions were conducted either in the study hall of the high-risk pregnancy department (Department 21) or in the health teaching room of the antenatal clinics, both of which were well-prepared for conducting educational sessions for pregnant women. Each session included 3-4 pregnant women and lasted approximately one hour.

The program sessions included various activities for the pregnant women in the study group, including:

1. **Session One (Introductory Session):** Identifying the pregnant women, defining the purpose and rules of the program, and gaining their cooperation.
2. **Session Two (Psychoeducation):** Providing information about the basic concepts of the program, including stress, depression, and preeclampsia, and raising awareness about the impact of these factors on their health and fetal health.
3. **Session Three (Expressing Feelings):** Enhancing the women's ability to express their feelings and increasing their awareness of situations that provoke negative feelings and cause psychological stress and depression.
4. **Session Four (Identifying Negative Thoughts):** Helping the women identify faulty and negative thoughts that lead to psychological stress and depression.
5. **Session Five (Modifying Negative Thoughts):** Assisting the women in transforming negative thoughts into positive ones.
6. **Session Six (Stress Management Skills):** Teaching stress management skills such as breathing exercises, imagination, and recalling happy situations.
7. **Session Seven (Distraction Techniques):** Helping the women overcome stress and depression through distraction techniques like counting or focusing on a picture and identifying blue objects within it.
8. **Session Eight (Problem-Solving Skills):** Teaching the women problem-solving skills, including identifying problems, collecting relevant information, formulating possible solutions, and selecting the proper solution.
9. **Session Nine (Ending Session):** Reviewing the skills taught during the sessions and measuring the program's impact

The control group received standard hospital care for preeclampsia. This included medication to manage the symptoms, along with either hospitalization or home care. The women also had weekly follow-up visits at the antenatal clinics, depending on their condition and the physician's decision.

Assessments were conducted for the control group using the same tool as the intervention group, both at the beginning and end of the study.

**Evaluation Phase (Post-test):** One week after the final session, a post-test assessment was conducted for both groups to evaluate stress levels, depression levels, and women's knowledge regarding preeclampsia.

**Statistical Analysis**

Data were entered into the Statistical Package for Social Sciences (SPSS) version 20.0. Demographic data and obstetric history were analyzed using frequencies and percentages. The Chi-square test was employed to determine significant differences between

the intervention and control groups regarding perceived stress scale (PSS) scores, Beck Depression Inventory-II (BDI-II) scores, and knowledge about preeclampsia.

## Results

Table 1 shows that there was no significant difference between the two groups regarding sociodemographic characteristics. The mean age of the study group was  $30.42 \pm 6.06$  years, compared to  $29.20 \pm 4.68$  years in the control group. Additionally, 31.4% of the pregnant women in the study group had received secondary education compared with 25.7% in the control group. About 88.6% of women in the study group were housewives, compared to 77.1% in the control group. Furthermore, 51.4% of pregnant women in the study group lived in urban areas, compared to 62.8% in the control group. Lastly, approximately 60% of the study group and 62.9% of the control group reported having sufficient income.

Table 2 shows that there were no significant differences between the two groups regarding obstetric profiles. The mean gestational age was  $25.17 \pm 2.59$  weeks in the study group and  $24.97 \pm 2.66$  weeks in the control group. Approximately 40% of the study group were multigravida (pregnant more than three times), compared to 54.3% in the control group. Additionally, 54.3% of the study group were primipara, whereas 40% in the control group were primipara. Moreover, 54.3% of the study group and 57.1% of the control group had no previous abortions.

Table 3 indicates that there was no significant difference in the level of perceived stress between the study and control groups at

the pretest, with  $p=0.64$ . However, following the implementation of the cognitive-behavioral therapy program, there was a significant difference in perceived stress levels between the study and control groups at the post-test with  $p=0.001$ . At this point, 68.6% of the study group reported mild perceived stress, compared to 11.4% of the control group.

Table 4 shows that there was no statistically significant difference in the level of depression between the study and control groups at the pre-test, with a p-value of 0.102. However, at the post-test, a significant difference in depression levels was observed between the groups, with 57.1% of the study group experiencing no depression compared to 8.6% of the control group ( $p=0.001$ ).

Figure 1 shows that there was no statistically significant difference in preeclampsia-related knowledge between the two groups at the pretest, with  $p=0.07$ . Approximately 94.3% of the study group had a low level of knowledge about preeclampsia, compared to 80% in the control group. Conversely, 5.7% of the study group and 20% of the control group had an acceptable level of knowledge, while neither group had a high level of knowledge about preeclampsia.

Figure 2 shows a statistically significant difference in preeclampsia-related knowledge between the two groups at the posttest, with  $p=0.001$ . Approximately 65.7% of the study group had a high level of knowledge about preeclampsia, compared to 0% in the control group. Conversely, 65.7% of the control group had a low level of knowledge, whereas 0% of the study group had a low level of knowledge.



**Table 1:** Socio-Demographic Characteristics of pregnant Women among the Study Group(n=35) and the ControlGroup(n=35)

Items	Study		Control		X2	p-value
	N	%	N	%		
<b>Age</b>						
20-25	10	28.6%	14	40%	24.53	0.067
21- 30	7	20%	8	22.8%		
31-35	12	34.3%	12	34.3%		
≥36	6	17.1%	1	2.9%		
<b>Mean± SD</b>	30.42± 6.06		29.20±4.68			
<b>Education level</b>						
Read &Write	4	11.4%	9	25.7%	4.31	0.505
Primary School	2	5.7%	0	0%		
Preparatory School	9	25.7%	9	25.7%		
Secondary School	11	31.4%	9	25.7%		
High education	9	25.8%	8	22.9%		
<b>Occupation</b>						
House wife	31	88.6%	27	77.1%	1.60	0.205
Working	4	11.4%	8	22.9%		
<b>Residence</b>						
Rural	17	48.6%	13	37.2%	.933	0.334
Urban	18	51.4%	22	62.8%		
<b>Income</b>						
Sufficient	21	60%	22	62.9%	.060	.806
Insufficient	14	40%	13	37.1%		

**Table 2.** Distribution of women among the study group (n=35) and control group (n=35) in relation to obstetric profile

Item	Study group		Control group		X <sup>2</sup>	p-value
	N	%	N	%		
<b>GA</b>						
20-25 weeks	21	60%	16	45.7%	1.43	0.231
26-30weeks	14	40%	19	54.3%		
<b>Mean± SD</b>	25.17±2.59	24.97±2.66				
<b>Gravidity</b>						
Primigravida	6	17.2%	7	20%	8.22	0.22
Gravida 2	4	11.4%	0	0%		
Gravida 3	11	31.4%	9	25.7%		
More than 3	14	40%	19	54.3%		
<b>Parity</b>						
Nullipara	8	22.9%	5	14.3%	7.84	0.27
Primipara	19	54.3%	14	40%		
Multipara	8	22.9%	16	45.7%		
<b>Abortion</b>						
No abortion	19	54.3%	20	57.1%	0.103	0.95
1-2 abortion	9	25.7%	9	25.8%		
More than 2	7	20%	6	17.1%		

Significant at p-value &lt;0.05

**Table (3) Distribution of the pregnant Women in the Study Group(n=35) and Control Group (n=35) in Relation to pre/ posttest of perceived stress level**

Perceived stress level	Pre-test				X <sup>2</sup>	P	Post-test				X <sup>2</sup>	P
	Study		Control				Study		Control			
	N	%	N	%			N	%	N	%		
Mild	2	5.7	4	11.4	0.88	0.64	24	68.6	4	11.4	28.4	0.001
Moderate	23	65.7	23	65.7			11	31.4	19	54.3		
Severe	10	28.6	8	22.9			0	0	12	34.3		

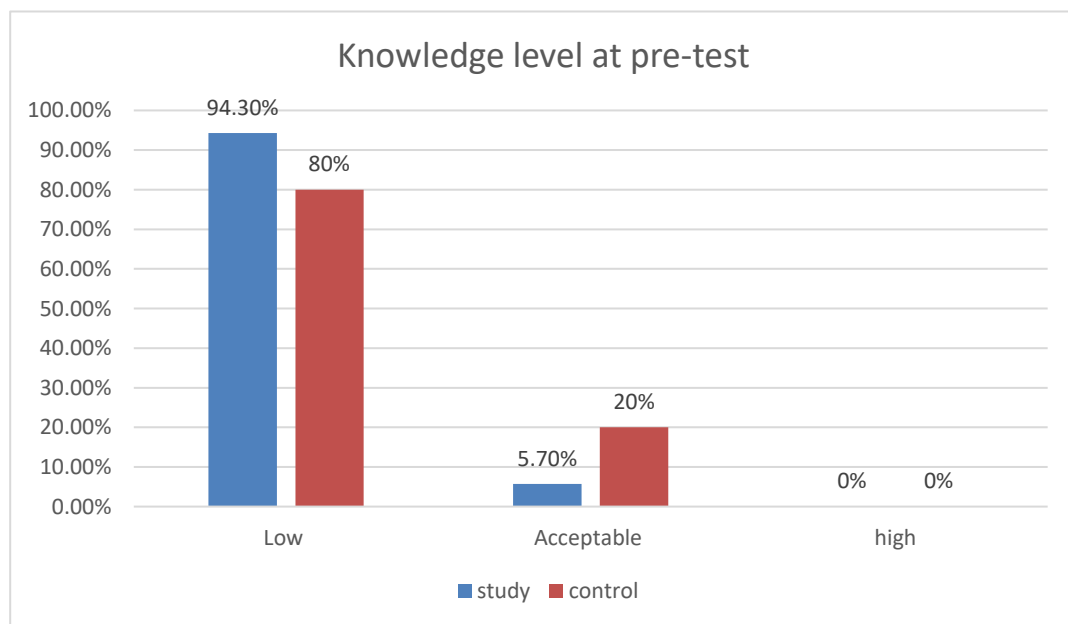
\*Significant at p-value <0.05.

**Table (4): Distribution of the pregnant women in the Study Group(n=35) and Control Group(n=35) in Relation to pre-test and posttest of depression level**

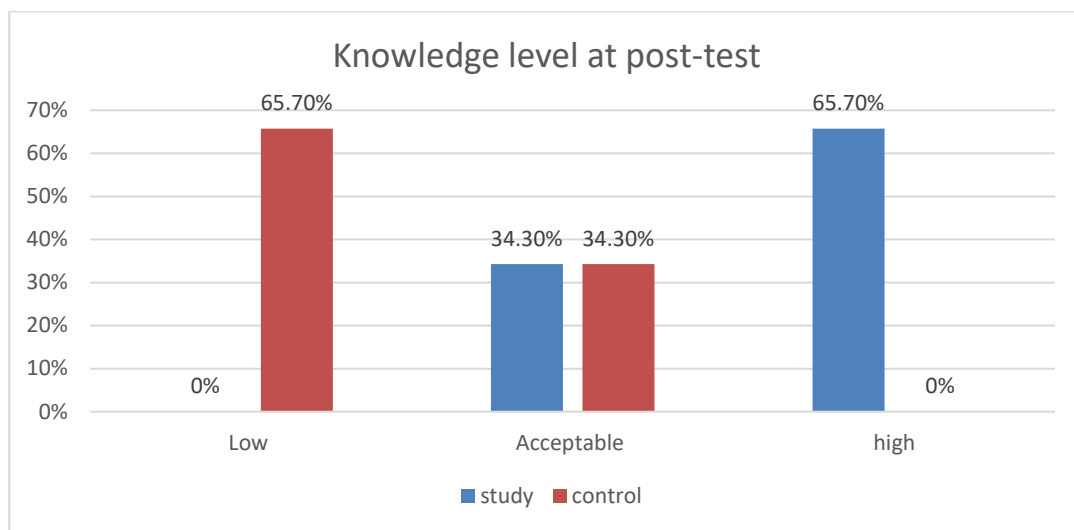
Depression level	Pre-test				X <sup>2</sup>	p	Post-test				X <sup>2</sup>	p
	Study		Control				Study		Control			
	N	%	N	%			N	%	N	%		
No depression	0	0	0	0	6.19	0.10	20	57.2	3	8.6	27.5	0.001
Mild depression	9	25.7	14	40			13	37.1	12	34.3		
Moderate depression	24	68.6	17	48.6			2	5.7	15	42.9		
Severe depression	2	5.7	4	11.4			0	0	5	14.2		
Very severe depression	0	0	0	0			0	0	0	0		

\*Significant at p-value <0.05.

**Figure (1): Distribution of the pregnant Women in the Study Group(n=35) and Control Group (n=35) in Relation to pre-test of knowledge related to preeclampsia**



**Figure (2):** Distribution of the pregnant Women in the Study Group(n=35) and Control Group (n=35) in Relation to post -test of knowledge related to preeclampsia



## Discussion

The current study was conducted to assess the effect of cognitive behavioral therapy on stress and depression among pregnant women with preeclampsia. This chapter will discuss the current study results in relation to other research studies regarding the following hypotheses:

- **H1:** Pregnant women with preeclampsia who are subjected to the cognitive-behavioral therapy program will get lower scores on the stress scale compared to those who will receive routine hospital care.
- **H2:** Pregnant women with preeclampsia who are subjected to the cognitive-behavioral therapy program will get lower scores on the depression scale than those who will receive routine hospital care.

### Part I: Socio-demographic characteristics and obstetric profile of the studied sample for both groups

Regarding the education levels of the studied sample (both study and control groups), the present study found that more than one-third of women in the study group had received secondary education, compared to one-quarter in the control group. This disparity may be attributed to a lack of family awareness about the benefits of education for girls, which

impacts various aspects of their lives, including social, psychological, and financial outcomes. Additionally, cultural norms in many families might prioritize early marriage over education for girls, reinforcing traditional roles focused on raising children and managing household responsibilities. These findings align with Hassan, Gouda, El-Monshed, and Kandeel (2020), who noted that approximately one-third of women in both groups had secondary education. Conversely, Hankin et al. (2023) found that one-third of women in both groups were highly educated, while El Halim, Farahat, and Sayed (2022) reported that two-fifths of women could read and write.

The study also revealed that most women in the study group were housewives, with more than three-quarters of pregnant women in the control group also being housewives. This trend may be due to lower educational levels limiting employment opportunities or because the demands of household responsibilities, including child-rearing, reduce available time for work. These findings are consistent with those of Abazarnejad et al. (2019) and Nurhidayah & Kusumawati (2023), who also reported that the majority of women in both groups were housewives. In contrast, El Halim, Farahat, and Sayed (2022) found that the majority of women in their study were employed in government positions.

Furthermore, the study highlighted that more than half of the women in the study group and nearly one-third of women in the control group had no previous abortions. This may be due to increased awareness of the importance of regular prenatal care, better healthcare services, or educational and counseling programs provided to pregnant women. This result is supported by Abazarnejad et al. (2019), who reported that two-thirds of women in both groups had no previous abortions.

### **Part (II): a comparison between stress, depression, and knowledge of study and control groups pre- and post-intervention**

The results of this study revealed that there was no statistically significant difference in the level of perceived stress between the study and control groups at the pretest, with  $p = 0.64$ . However, at the posttest after application of the cognitive behavioral therapy program for the study group, there was a highly statistically significant difference in stress level between the study and control groups ( $p = 0.001$ ). This result indicated that a cognitive-behavioral program can play an important role in reducing stress among pregnant women with preeclampsia by using multiple activities, techniques, and skills that increase the ability to cope and reduce the stress level felt by pregnant women, such as stress management skills, relaxation techniques, problem-solving skills, and distraction techniques. In addition, provide an appropriate atmosphere during the application of this program full of love, affection, and cooperation.

These previous results indicate that there is an improvement in the level of stress in pregnant women with preeclampsia, which occurred as a response to the impact of cognitive behavioral therapy programs. Therefore, the first hypothesis, that pregnant women with preeclampsia who are subjected to the cognitive behavioral therapy program will get lower scores on the stress scale than before program implementation, is supported. The current study results, consistent with the study of Asghari, Faramarzi, and Mohammadi (2016), indicated that there was a significant difference in perceived stress level between the study and control groups. These results were

also supported by Gouda, Hassan, Kandeel, & El-Monshed, (2020) demonstrated a notable disparity in stress scores before and after cognitive behavioral therapy among pregnant women in the intervention group, showing statistical significance ( $P \leq 0.001$ ) and a substantial effect size ( $\eta^2 = 0.7$ ). On the other hand, within the control group, there was no statistical difference was observed in stress scores before and after receiving routine care ( $P > 0.05$ ). Moreover, Li et al, (2022) & Gonzalez et al (2020), demonstrated short- and long-term efficacy of CBT in treating and preventing stress among pregnant women and revealed that the study group of pregnant women have lower levels of stress after attending the cognitive behavioral therapy than control group.

The results of this study showed that there was no statistically significant difference in the level of depression between the study and control groups at the pretest, with a p-value of 0.102. However, at the posttest after application of the cognitive behavioral therapy program for the study group, there was a highly statistically significant difference in depression level between the study and control groups ( $p = 0.001$ ). This result indicated that cognitive-behavioral programs can play an important role in reducing depression among pregnant women with preeclampsia. Furthermore, CBT focuses on emotions and thoughts. Negative or dysfunctional thoughts predispose a pregnant woman to negative emotions. To improve negative emotions, CBT focuses on changing dysfunctional thoughts and replacing them with a more healthy thinking style by using specific techniques and skills. In addition, all supportive sessions in this program concentrate on modifying the negative thoughts of pregnant women, expressing negative feelings, stress management skills, relaxation techniques, and problem-solving strategies.

The previous results indicated that there was improvement in Pregnant Women with Preeclampsia level of depression which occurred as a response to impact of cognitive behavioral therapy program Therefore, the second hypothesis, that pregnant women with preeclampsia who are subjected to the cognitive behavioral therapy program will get lower scores on the depression scale than

before program implementation, is supported. In the same vein, this result was in congruence with Asghari, Faramarzi, and Mohammadi (2016) and Hankin et al. (2023), who indicated that there was a significant difference in depression level between the study and control groups. In addition, these results are consistent with the study of Gouda, Hassan, Kandeel, & El-Monshed, (2020) noted a significant statistical difference in depression scores before and after cognitive behavioral therapy among pregnant women in the intervention group ( $P \leq 0.001$ ). while in the control group, there was no statistical difference in scores of depression pre and post the routine care ( $P > 0.05$ ). Also, Hosseinian, Kashani & Peyman (2022) indicated that CBT-based interventions for perinatal depression are effective during pregnancy and reported that there was a statistically significant difference in depression scores before and after the cognitive behavioral therapy within the intervention group ( $p < 0.001$ ).

The results of this study illustrated that there was no statistically significant difference in preeclampsia-related knowledge between the two groups at the pretest, with  $p = 0.07$ . However, at the posttest, there was a significant difference in knowledge between the study and control groups ( $p = 0.001$ ). This result might be due to pregnant women's interest in protecting their lives from any dangers during the pregnancy period. Also, this result indicated that cognitive-behavioral programs can play an important role in improving the knowledge of pregnant women with the meaning of preeclampsia, signs and symptoms, risk factors, complications, and negative physical and psychological consequences of preeclampsia on pregnant women. This result was in accordance with El Halim, Farahat, and Sayed (2022), who revealed that there was a statistically significant difference in knowledge between the study and control groups after the intervention program.

### Conclusion

Based on the results of the current study, it was concluded that research hypotheses were supported and the cognitive behavioral therapy program had a positive effect on reducing

depression and stress among pregnant women with preeclampsia.

### Limitations of the study

- Obtaining written consent from the high-risk pregnancy unit of the obstetrics and gynecology hospital to implement the study program was challenging.
- There was low willingness among the pregnant women with preeclampsia to participate in the program. The researcher had to motivate them by emphasizing the importance of the program in reducing stress and depression
- Due to the crowdedness and noise in the antenatal clinic, the researcher had to wait for the participants to complete their follow-ups before starting the program sessions
- To enhance the therapeutic effect of the program, the researcher divided the study group into subgroups of 3 to 4 pregnant women and repeated each session multiple times.

### Recommendation

- 1- Disseminate the CBT program to all antenatal clinics, high-risk pregnancy units, and maternity hospitals.
- 2- Implement a continuous training program for nurses at maternity hospitals and family health centers on the CBT approach.
- 3- Repeat the study in several maternity facilities using a larger representative probability sample to further generalize the findings.
- 4- Highlighting the significance of collaboration between obstetricians and psychiatric specialists to enhance the well-being of pregnant women.
- 5- Provide educational programs for pregnant women to teach them stress management, effective coping strategies, and problem-solving skills to deal with their psychological problems during pregnancy.

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