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The Effect of the Empowerment Model on Pregnant Women's Self-Care Practice for Early Detection of Preeclampsia

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Abstract: **Background: Pre-eclampsia is a life-threatening condition of pregnancy, especially in developing countries that has many adverse effects on maternal and fetal conditions. Increasing women's awareness of pre-eclampsia is recommended to promote self-care practice and hypertension control to prevent its serious complications and early detection of preeclampsia. Aim: to evaluate the effect of the empowerment model on pregnant women's self-care practice for early detection of preeclampsia. Research design: A quasi-experimental research design was used to conduct this study Setting: The study was conducted at Maternal and child health center in (Al-Hadiqa) in Fayoum city, Egypt. Sample: A convenient sample of 70 pregnant women was recruited. Tools: Two tools were used for data collection. Tool I: A Structured interviewing questionnaire: Tool II: Self-care reported practice. Results: The study revealed that there were statistically significant improvements in the studied pregnant women's knowledge, and self-care reported practice post-intervention in comparison with pre-intervention ($p<0.001$). Conclusion: The empowerment model had a significant positive effect on enhancement of knowledge, and self-care practices of pregnant women for early detection of preeclampsia. Recommendation: Continuous health education programs should be an integral part of the routine antenatal care for pregnant women regarding preeclampsia can help in providing continuous support and early detection of preeclampsia during pregnancy.**

Keywords: **Early detection, Empowerment Model, Preeclampsia, Pregnant women, Self-Care Practice.**

1. INTRODUCTION

It's important to note that after the 20th week of pregnancy, women with normal blood pressure and no history of protein in their urine may develop preeclampsia (PE), which is a pregnancy-specific disorder characterized by hypertension, proteinuria (> 300 mg/day), and edema. Therefore, it's essential to monitor blood pressure and urine protein levels regularly during pregnancy to detect any signs of preeclampsia **(Chang, Seow& Chen., 2023).** Worldwide, Preeclampsia leads to maternal morbidity and ranks among the top five causes of maternal and neonatal fatalities **(Abd Elgwad, Mourad& Mahmoud., 2021).**

In fact, the risk factors for preeclampsia can vary from woman to woman. Those who have a previous history of hypertensive disease during pregnancy or have a maternal disease such as chronic kidney disease, autoimmune diseases, diabetes, or chronic hypertension may be at higher risk. It's important for pregnant women to discuss any potential risk factors with their healthcare provider to ensure proper monitoring and care throughout their pregnancy **(Yevgenevna., 2025).**

Additionally, gestational hypertension, polycystic ovarian syndrome, and existence of other infections such as urinary tract infections and helicobacter pylori increase the risk for preeclampsia. The risk for preeclampsia may be moderate with family history of preeclampsia, nulliparity, increase body mass index (BMI) of more than 35 kg/m, advanced maternal age, large interval more than ten years between pregnancies, and multiple pregnancy **(Sabry, Atia& Abd Elkhalek., 2021)**

Preeclampsia has negative impact on both maternal and neonatal pregnancy outcomes. For the mother, the possibility of eclampsia, preterm delivery, placental abruption, increased rates of cesarean sections, postpartum hemorrhage, and maternal mortality. Negative outcomes for the newborns include asphyxia at birth, prematurity, intrauterine growth retardation and admission to the intensive care unit **(Buciu et al., 2025)**

Empowerment of pregnant women through health education for mothers as an effort to improve maternal self-care is able to increase mother's knowledge and skills in self-care to prevent and early detection of preeclampsia **(Emilda, et al., 2023).**

Early detection and prevention of preeclampsia (PE) are very important to avoid morbidity and mortality associated with them. Preeclampsia can be prevented by reducing the number of pregnancies in women who are high-risk for the condition, enhancing the nutritional intake of women through dietary salt restriction, calcium and vitamin D supplementation, lifestyle modifications, and exercise to lower the risk of the condition, and lowering stress levels to enhance the mental health of mothers. In addition, taking enough rest and beginning low-dose aspirin at or before 16 weeks of pregnancy to target placental pathology are potential interventions to reduce the occurrence of preeclampsia **(Moulaei et al., 2021).**

Self-care help pregnant women and health care providers take effective measures to control and prevent gestational hypertension, and to provide endorsed solutions for improving maternal and neonatal health. It is now clear that the onset of the disease is multifactorial, and interventions for management of preeclampsia will necessarily have to address a wide range of factors through lifestyle and diet modification and multidisciplinary care **(Aquino, et al., 2022).**

Nurses play an important role in preeclampsia management which includes providing guidance and teach women regarding evidence-based approaches for minimizing preeclampsia risk. Encouraging all women during pregnancy to plan and work toward achieving a healthy body weight and consume a healthy diet with recommended nutrients. Providing guidance regarding limit foods with added sugars and those that are high in fat and eat a variety of fruits, grains, vegetables, low-fat or fat-free dairy, and proteins, avoiding such sources of mercury as shark, swordfish, mackerel, and tilefish, and limiting the consumption of another source, tuna, to less than six ounces per week **(Botutihe, Herdyana& Widiyanto., 2025).**

Significance of the study:

Pre-eclampsia is not only the most prevalent obstetric pregnancy complication, but it is also one of the top three global factors that contribute to maternal and perinatal mortality and morbidity, particularly in low- and middle income countries **(Sole, et al., 2022).** Currently accounting for 10 to 15% of all maternal deaths worldwide (**Parrales-Bravo, et al., 2025)**

The global occurrence of high-risk pregnancies suggests that 2-8% of pregnancies are impacted by pre-eclampsia or eclampsia. In Egypt, eclampsia occurs in 0.3% of pregnancies, while preeclampsia is seen in 27.7% of expectant mothers. A study carried out in Egypt found that preeclampsia and eclampsia together represent 14.9% of the causes of maternal mortality. This underscores the considerable effect of these hypertensive disorders on maternal health in the area (**Mohamed, Awaga** & **Sabry., 2025)**

Each year, it globally contributes to about 500,000 foetal and neonatal fatalities and 46,000 maternal deaths **(Longo, 2022; Gholami, et al., 2022).** While maternal deaths are estimated to be 16% in high-income countries and 9%- 26% in low income countries **(Haile, et al., 2021).** Globally, the majority of pre eclamptic women have poor knowledge of their disease leading to delays in seeking care so many serious complications can occur **(Gholami, et al., 2022).**

In Egypt, there is inadequacy of data on the quality of health care services offered to high risk pregnant women, lack of knowledge about preeclampsia effect, management as well as nursing care measures to reduce complications and to educate the pregnant women about self-care measures. Also, there is an imperative need for teaching, motivating and empowering pregnant women for preeclamsia to self-manage and comply with treatment to detect early and prevent the occurrence of preeclampsia so this study was designed **(Mohammed & Ghafel., 2022).**

Aim of the Study:

This study aimed to evaluate the effect of the empowerment model on pregnant women's self-care practice for early detection of preeclampsia.

Operational Definition

Empowerment model: refers to the application of the empowerment model through health education for pregnant women as an effort to improve maternal self-care ability to increase pregnant women' knowledge, improve attitude and skills in self-care for early detection of preeclampsia.

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2. SUBJECTS & METHODS

Research Hypothesis:

The current study hypothesized that: Application of the empowerment model improves pregnant women's knowledge, and self-care practice for early detection of preeclampsia.

Research design: A quasi-experimental (one group pre & post) was used in the study.

Setting: The study was conducted at Maternal and child health center in (Al-Hadiqa) in Fayoum city.

Sampling:

Sample type:

Convenient sample was used in this study.

Sample size:

70 pregnant women were selected according to this equation.

$$n = \left(\frac{Z_{1-\alpha/2} + Z_{1-\beta}}{ES} \right)^2$$

Zα = Standard normal deviate for α = 1.9600.

Zβ = Standard normal deviate for β = 0.8416.

B = (Zα + Zβ)2 = 7.8489.

C = (E/SΔ)2 = 0.1128.

N = B/C = 69. 5972.

The N thus calculated is rounded up to the next highest integer to give the group size.

$n = (\frac{1.96+0.84}{0.1128.})^2 = 69.5972 \approx 70$ pregnant women)

Tools of data collection:

Tool I: Structured Interviewing Questionnaire: Developed by the researcher after reviewing the related current and previous literature. It was written in an Arabic language and included 4 parts.

First part: Demographic characteristics that consisted of six items as age, education, marital status, occupation, residence and income.

Second part: Which assessed past medical and obstetric history composed of (15) open, close-end and multiple choices questions such as (chronic diseases, gravida, para number, mode of previous delivery, complications of previous pregnancies, delivery, and postpartum, follow up during previous pregnancies, family history of preeclampsia, and the duration of last pregnancy and delivery).

Third part: history of Present pregnancy composed of (7) close-end and multiple choices questions such as (gestational age, complications during pregnancy, Pregnancy in twins, fetal movements, follow-up, and antenatal visists).

Fourth part: Women's Knowledge questionnaire (pre-post test) about preeclampsia.

It was used to assess women knowledge about preeclampsia. It included twelve questions which cover all information about preeclampsia such as (concept, risk factors, degrees, timing, if possible to continue postpartum, if preeclampsia is dangerous, sign and symptoms, preventive measures, diagnosis, complication, treatment, and natural way to relieve). Also, source of information question. It was written in an Arabic language.

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Scoring System:

Each correct answer in knowledge questionnaire score (one) and the wrong answer or don't know took zero with total scores of 12. The total score was summed and converted into two categories as follow:

- Satisfactory knowledge: (≥60) (≥7-12)
- Unsatisfactory knowledge: (< 60%) with score (<7) **(Ahmed, Youness &Hasab Allah., 2022)**

Tool II: Self-care reported practice (Pre- post test).

It was constructed to assess reported women practices regarding self-care, pre/post intervention. It included 22 questions related to nutrition, sleep and rest, daily activities, personal hygiene, and pregnancy follow-up. It was written in an Arabic language. It was adapted from **(Abd Elhaleem et al., 2021).**

Scoring System:

Done practices take one and not done take zero. With 22 total grade score that summed up and divided to two categories as the follows:

- **Adequate practice** ≥50% with score (≥11-22) and **inadequate practice**< 50% (<11)

Supportive material:

It was designed by the researcher to enhance women's knowledge and self-care practice for prevention and early detection of preeclampsia, in the form of brochure using an Arabic language and different illustrative pictures, it consisted of two parts, the first one concerned with providing the mothers with the essential information about preeclampsia (definition, causes, risk factors, signs & symptoms, degrees, diagnosis, complication, and treatment). While the second part concerned with self-care practices for prevention and early detection of preeclampsia (nutrition, sleep and rest, daily activities, personal hygiene, and pregnancy follow up).

Validity:

It was established by a panel of three expertise's university professors in Maternal and Newborn Health Nursing from different nursing faculties: Cairo, Fayoum and Helwan who reviewed and measure the face and content validity of tools and according to their opinions and comments, the modification was done.

Reliability of the tools:

Table (1): Alpha Cronbach Reliability Analysis of the Used Tool

Reliability test	Cronbach s Alpha test
Knowledge tool	0.92
Practice tool	0.69

This table show reliability in knowledge, , and practice tool when alpha Cronbach was >0.5.

Ethical considerations:

An official permission to conduct the proposed study was obtained from the Scientific Research Ethics Committee faculty of nursing Helwan University. Participation in the study is voluntary and subjects were given complete full information about the study and their role before signing the oral consent. The ethical considerations included explaining the purpose and nature of the study, stating the possibility to withdraw at any time, confidentiality of the information where it was not be accessed by any other party without taking permission of the participants. Ethics, values, culture and beliefs were respected

Pilot study:

A pilot study was carried out on 10% from the study subjects (7 pregnant women) to test the applicability, clarity and the efficiency of the tools. There were no modifications found after the pilot study. So, these (7) pregnant women were included in the study.

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Fieldwork:

Approval to carry out this study was obtained from director of the health care center.

Data collection started from beginning of July 2024 till the end of December 2024, 2 days per week from 9 am to 1 pm till the study sample was complete.

Assessment phase:

The researcher introduced herself to pregnant women and explained the aim of the study and its implications, informed consent was obtained. The researcher met each pregnant women separately for explaining the tools of data collection, filling the interviewing questionnaire to assess pregnant women' general characteristics, obstetrical history, and history of present pregnancy then the mother knowledge regarding preeclampsia, and the researcher assessed reported mothers' self-care practice.

Planning phase:

This phase aims at planning for educational sessions through:

- Assessing pregnant women's knowledge educational need
- Identify learning objectives of the educational sessions.
- Determine learning contents of the educational sessions.
- Choose teaching methods as brain storming, discussion and lecture
- Education media as video through labtop& Educational brochure
- By the end of the educational sessions, pregnant women would be able to acquire essential knowledge, and healthy reported practices for early detection of preeclampsia**.**

Implementation phase:

Four educational sessions regarding preeclampsia were given to pregnant women. Two theoretical and Two practical sessions were provided 1-2 pregnant women per day, Each session took about 30-45 minutes according to studied women's achievement and feedback. At the beginning of the first session pregnant women was oriented with the intervention contents. The subsequent session started by feedback about the previous session and the objectives of the new session, simple Arabic language was used to suit women's level of understanding. At the end of each session, five minutes devoted to permit women to ask questions to clarify the session contents and to correct any misunderstanding. Each woman was informed about the time of the next sessions. Different methods of teaching were used such as lectures, group discussions, and brain storming. Instructional media included the brochure was distributed to all recruited women in the study from the first session to achieve its objectives. Moreover, the researcher used supportive tools that function as stimulus control to support desired changes include lab top, stickers and posters or banner that reinforce the concepts of the intervention and emphasizing the effects of educational sessions on women's knowledge and practices. The educational sessions was implemented in the health care center during researcher visiting health care center three days/ week in the waiting room in Fayoum city. The room was quiet, had adequate lightening, well ventilated, and had spacing for implementing educational sessions.

First session covered definition, causes, risk factors, and signs and symptom of preeclampsia

Second session covered degrees, diagnosis, treatment and complication of preeclampsia

Third session concerned with the discussion of pregnant women's practices of preventive behavior about preeclampsia regarding nutrition such as eating the recommended diet to prevent preeclampsia (a diet rich in protein, calcium, zinc, and magnesium, a diet rich in vegetables and fruits, a low-salt and low-fat diet, avoiding fried and ready-made foods, drinking alcohol, and cola drinks and that contain caffeine, also, drinking 6-8 cups of water daily. Regarding rest and sleep such as get enough sleep (8 hours or more per day) at night, take a rest during the day, and sleep on your left side to reduce the weight of the fetus on the blood vessels

Fourth session concerned with pregnant women's practices of preventive behavior about preeclampsia regarding daily activities such as do exercise, such as walking, for at least 30 minutes a day, do activities that help in relaxing, such as watching TV. Regarding personal hygiene such as take a warm bath daily to reduce stress, follow up with the dentist regularly, and brush the teeth daily after every meal. Regarding follow up such as follow up regularly with the doctor, take calcium, vitamin D and iron supplements, measure the blood pressure constantly, urine protein analysis, check the weight frequently, notice the number of fetal movements daily and notice signs and symptoms of danger, such as headache, generalized edema, including the face, blurred vision, vomiting, feeling sharp pain in the upper abdomen on the right side, and oliguria. Prepared videos and attractive pictures were presented. At the end of each session, the important points were reviewed.

Educational brochure:

A brochure including all content of the educational sessions was designed and given to pregnant women as an educator during educational sessions implementation. Its aim was providing accurate knowledge & practice related to preeclampsia.

Evaluation phase:

Evaluation was applied after implementation educational sessions through post- test using the same tools in order to identify differences, similarities and areas of improvement as well as defects and estimate the effect of the educational sessions on improving pregnant women's knowledge and practices.

Statistical Design:

Data was collected, coded and entered into a personal computer. It was analyzed using Statistical Package for the Social Science (SPSS), version 24 for analysis. The collected data was organized, revised, analyzed and presented in numbers and percentage in tables, figures and diagram. Proper and suitable statistical tests were used to test the significance of the results obtained. The following statistical techniques were used, the P value will be set at 0.05. Descriptive statistics tests as numbers, percentage, the arithmetic mean (X) and standard deviation (± SD), will be used to describe the results. Appropriate inferential statistics such as "F" test or "t" test will be used as well.

3. RESULTS

Table (1) shows that, nearly two third of the studied pregnant women (62.9%) were aged between 20-<30 years old. the Mean ± SD of age was 28.0714±5.49920. Regarding the level of education, nearly one third of the study sample (31.4%) had secondary education. Also, all of them (100%) were married. Majority of the studied pregnant women live in urban area and housewives (84.3% &78.6%) respectively. Furthermore, nearly half (48.6%) of them had adequate economic status.

Table (2) shows that, about one quarter (22.9%) of the studied pregnant women have previous medical history, 68.75% of them have diabetes mellitus and all of them (22.9%) take medication for treatment the medical disorder. Moreover, nearly three-quarters of the studied sample (74.3%) are multigravida. While, nearly half (47.2%) of the studied women have three to four delivery. Also, majority (82.7%) of the multigravida studied women delivered cesarean section. Furthermore, more than one third (38.46%) of the multigravida studied women have history of complications during previous pregnancy, nearly half (45%) of them have history of bleeding. Also, most (94.23%) of the muligravida studied women had regular previous antenatal follow-up. Likewise, about one third (30.76%) of the muligravida studied women have history of complications during previous birth, 37.5% of them have history of obstructed labor and premature birth. However, Only, 9.62% of the muligravida studied women have history of complications during postpartum, 80% of them have puerperal sepsis. Moreover, 14.3% of the studied pregnant women have family history of pre-eclampsia. Also, mean± SD of duration from last delivery is 3.73 ±2.08 years.

Figure (1) represents that, about one third (35.7%, 31.4%, 28.6%) of the studied pregnant women have information about preeclampsia from family, friends, and health team, respectively. While the minority (4.3%) get their information from mass media.

Figure (2) illustrates that most (90%) of the studied pregnant women have satisfactory level of knowledge regarding preeclampsia post intervention compared to less than one quarter (20%) of the studied pregnant women have satisfactory level of knowledge regarding preeclampsia pre intervention.

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Figure (3) illustrates that three quarters (75.7%) of the studied pregnant women have adequate level of total self-care reported practices regarding preeclampsia post intervention compared to nearly one third (31.4%) of the studied pregnant women have adequate level of total self-care reported practices regarding preeclampsia pre intervention.

Table (3) represents that there are no statistically significant correlation at pre-intervention between total pregnant women's knowledge, and self-care reported practices when $p > 0.05$. While there are statistically significant positive correlation at post-intervention between total pregnant women's knowledge, and self-care reported practices when $p \leq 0.05$

Table 1: Distribution of the studied pregnant women toward demographic characteristic (N = 70)

Items	N	%
Age		
<20	5	7.1
20 - < 30years	44	**62.9**
30 - < 35 years	13	18.6
≥35 years	8	11.4
M ±SD	28.0714±5.49920	
Educational level		
Can't read and write	20	28.6
Read and write	13	18.6
secondary	22	**31.4**
University	13	18.6
Postgraduate	2	2.8
Marital status		
Married	70	100
Divorced	0	0
Widow	0	0
Residence		
Rural	11	15.7
Urban	59	**84.3**
Occupational level		
Working	15	21.4
Housewife	55	**78.6**
Economic status		
Adequate	34	**48.6**
Adequate exactly	30	42.9
Inadequate	6	8.5

Table 2: Distribution of the studied pregnant women toward the medical and obstetrical history (N = 70)

Items	N	%
Medical history		
Yes	16	**22.9**
No	54	77.1
If Yes mention (n=16)		
Diabetes mellitus	11	**68.75**
Hypertension	1	6.25
Cardiac	2	12.5
Kidney	2	12.5
Taking any medication		
Yes	16	22.9
No	54	77.1
Number of pregnancy		
Primigravida	18	25.7
Multigravida	52	74.3
M ±SD	2.54 ±1.41	

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Number of delivery Nullipara 1-2 3-4	 18 19 33	 25.7 27.1 47.2
M ±SD	1.54 ±1.34	
Mode of previous delivery (n=52) Normal Vaginal delivery Caesarean Section	 9 43	 17.3 82.7
Complications during previous pregnancy (n=52) Yes No	 20 32	 38.46 61.54
If yes, mention… (n=20) Hypertension Preeclampsia Diabetes mellitus Bleeding	 6 2 3 9	 30 10 15 45
Regular previous antenatal follow-up (n=52) Yes No	 49 3	 94.23 5.77
Complications during previous birth (n=52) Yes No	 16 36	 30.76 69.24
If yes, mention (n=16) Obstructed labor Death baby Premature birth	 6 4 6	 37.5 25 37.5
Complications during previous postpartum? (n=52) Yes No	 5 47	 9.62 90.38
If yes, mention (n=5) Hypertension Puerperal sepsis	 1 4	 20 80
Family history of pre-eclampsia Yes No	 10 60	 14.3 85.7
Duration of last delivery Yrs.	3.73 ±2.08	

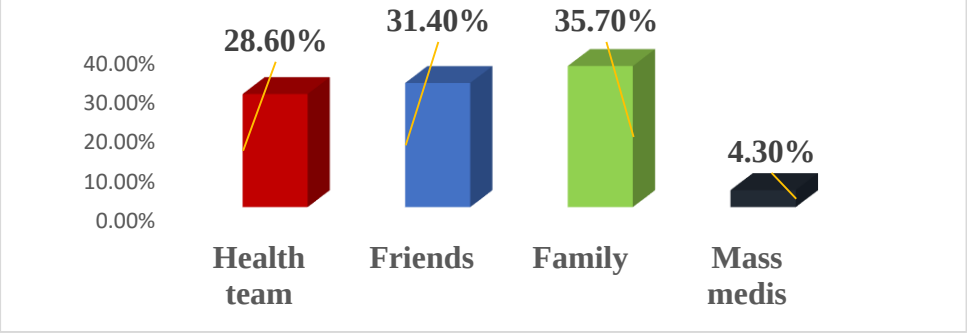

Figure (1): Distribution of the studied pregnant women regarding sources of the information about preeclampsia

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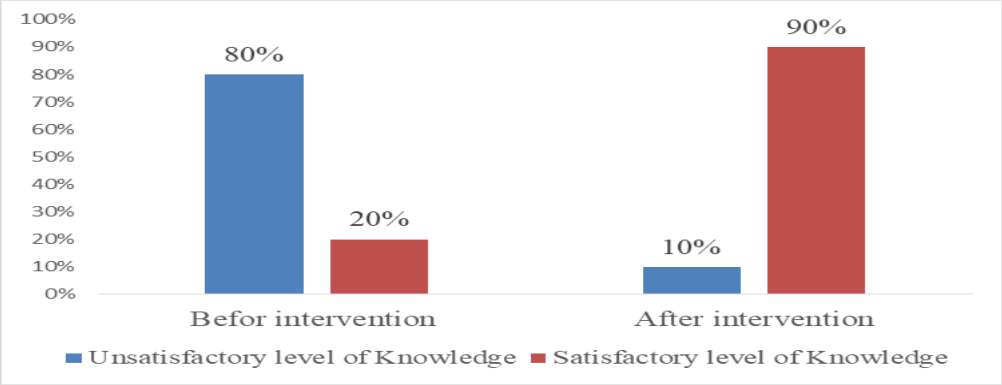

Figure (2) Distribution of total Knowledge of the studied pregnant women regarding pre-eclampsia pre/post intervention (n=70)

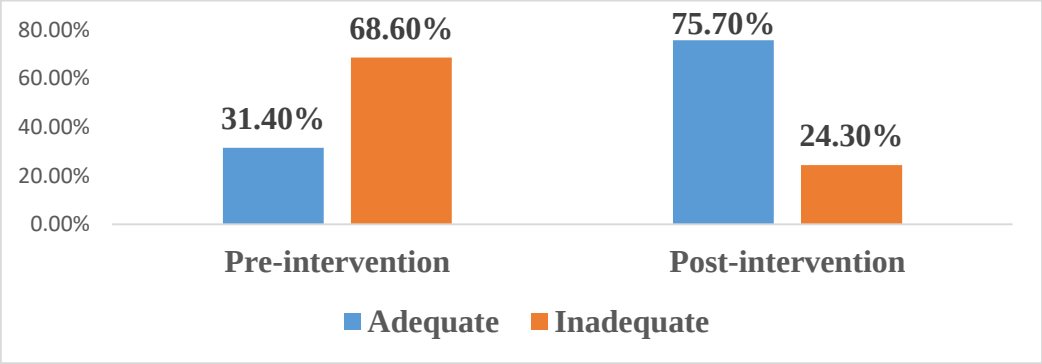

Figure (3) Distribution of the studied pregnant women's total self-care reported practice regarding preeclampsia pre-and post-intervention (n=70|).

Table (3): Correlation between total pregnant women' knowledge score, and total reported practices, pre and post-intervention (N = 70)

Items	Changes of scores of total knowledge and practices, before intervention				Changes of scores of total knowledge and Practice after intervention			
	knowledge		Practices		knowledge		Practices	
	r	p	r	P	r	p	r	P
knowledge	1	--	-0.14	0.24	1	---	0.52	0.001**
Practices	-0.14	0.24	1	--	0.52	0.001**	1	---

***Significant at p ≤0.05 **Highly significant at p ≤ 0.001 Not significant at p>0.05**

4. DISCUSSION

Preeclampsia defined as a global health problem, which accompanied by high rate of maternal and perinatal morbidity and mortality worldwide, currently accounting for 10 to 15% of all maternal deaths worldwide. Preeclampsia is a hypertensive disorder induced by pregnancy, it is characterized by high level of blood pressure which is equal or more than 140/90 mm Hg, in a previously normotensive women, in the absence of proteinuria or proteinuria +1, and edema at 20-24 weeks of gestation **(Parrales-Bravo et al., 2024).** .Therefore, the present study was carried out to examine the effect of the empowerment model on pregnant women's self-care practice for early detection of preeclampsia

Regading the demographic characteristics of the studied pregnant women, the study finding showed that nearly two third of the studied pregnant women were aged between 20-<30 years old. The Mean ± SD of age was 28.0714±5.49920, nearly one third of

the study sample had secondary education. Also, all of them were married. Majority of the studied pregnant women live in urban area and housewives. Furthermore, nearly half of them had adequate economic status. In the researcher point of view the majority of the studied pregnant women were housewives because nearly one third of the study sample had only secondary education.

These results were agreement with **Bukhari, et al.,(2021)** who conducted a study about " Knowledge of Preeclampsia and its Associated Factors Among Pregnant Women" a cross-sectional study conducted at the antenatal care unit of the Kwame Nkrumah University of Science and Technology Hospital in Kumasi, Ghana, and found that mean ± SD of age was 30.2 ± 5.3, most of the studied pregnant women were married and resided in urban centers, and nearly two third of them had secondary education or below.

In the same line theses finding supported by **Mou, et al., (2021)** who carried out study about " Prevalence of preeclampsia and the associated risk factors among pregnant women in Bangladesh" which reported that Mean±SD of age was 26.4±4.9, nearly three quarters of the studied pregnant women were living in Suburban or urban. Additionally, more than one third had secondary education. Moreover, most of the studied sample were housewives. Furthermore, this finding was agreed with **Ali, et al (2021)** who carried out A pre and post assessment research design about " Effect of an Educational Program on Modifying Lifestyle among Pregnant Women with Mild Preeclampsia." which was conducted at the antenatal outpatient unit, Port Said Maternity Hospital, Egypt and found that the personal data of the studied sample. It was estimated that, the mean age was (29.85±6.99), three quarter of the studied pregnant women were housewives, more than half of them had secondary education, and all of them were married.

Moreover, this finding was in the same context with **Mekie et al., (2021)** who carried out study about " Knowledge and attitude of pregnant women towards preeclampsia and its associated factors in South Gondar Zone, Northwest Ethiopia: a multi-center facility-based cross-sectional study. " and reported that more than three quarter of the studied pregnant women were aged between 17–34 years old, one quarter had Secondary education, most of them were married. Additionally, more than two third of the studied pregnant women were living in urban area, nearly half of them were housewives. Moreover, more than half of the studied pregnant women had adequate monthly household income

On the other hand, these finding were different from **Bohsas, et al., (2024)** who conducted a study entitled " Assessing pre-eclampsia awareness among pregnant women in Syria: a cross-sectional study on knowledge and perceptions" found that mean ± SD of age was 38.22 ± 10.79 years, nearly two third of the studied pregnant women had university educational level. Moreover, **Ahmed, Youness & Hasab Allah., (2022),** who carried out their study in Minia city, Egypt about "Impact of Self-Care Guidelines on Women's Awareness and Identification of Early Signs and Symptoms of Preeclampsia" and reported that was above 30 years with a mean age of 28.34 and about two thirds of studied women were from rural area.

Regarding health history of the studied pregnant women, the result of the current study evidence that, about one quarter of the studied pregnant women had previous medical history, more than two third of them had diabetes mellitus& nearly one third had hpertension and all of them took medication for treatment the medical disorder. Moreover, nearly three-quarters of the studied sample were multigravida. While, nearly half of the studied women had three to four delivery. Also, majority of the multigravida studied women delivered cesarean section. Furthermore, more than one third of the multigravida studied women had history of complications during previous pregnancy, nearly half of them had history of bleeding. Also, most of the muligravida studied women had regular previous antenatal follow-up. Likewise, about one third of the muligravida studied women have history of complications during previous birth, more than one third of them had history of obstructed labor and premature birth. However, Only, minority of the muligravida studied women had history of complications during postpartum, majority of them had puerperal sepsis. Moreover, minority (14.3%) of the studied pregnant women had family history of pre-eclampsia. Also, mean± SD of duration from last delivery is 3.73 ±2.08 years.

In the same line theses finding supported by **Elbana, Abd Elhady& Mohammed (2022)** who carried out a quasi-experimental study in the out-patient clinic in Benha university hospital, Egypt about " Self-Care Management Program Utilization among Antenatal Mothers with Pregnancy-Induced Hypertension" showed that nearly one third of the studied pregnant women had Previous medical illness, and nearly one quarter had pregnancy induced hypertension in previous pregnancies.

Furthermore, the study results agreed with **Alsabi, Orabi& Bajamal (2025)** who conducted their study about " Knowledge and attitude of pregnant women about preeclampsia in King Abdulaziz Medical City, Western Region: A cross-sectional study" in Saudi Arabia, and showed that only more than one third of the studied pregnant women had Medical disease, and nearly two third of them had diabetes mellitus. Also, minority (5.7%)& (9%) of the studied pregnant women had Family history of preeclampsia and Previous preeclampsia respectively. Moreover, half of the studied pregnant women had three or more number of pregnancy.

Additionally, the present study finding agreed with **Stitterich, et al., (2021)** who conducted a study about " Risk factors for preeclampsia and eclampsia at a main referral maternity hospital in Freetown, Sierra Leone: a case-control study" in west africa and found that nearly half of the studied women had more than two pregnancies, nearly two third of them had more than or equal one parity, majority had interpregnancy interval between 18–120 months, minority of them had Family history for preeclampsia and eclampsia

However ,This results is disagree with the study done by **Fikadu, et al., (2020)** who conducted a study entitled " Family history of chronic illness, preterm gestational age and smoking exposure before pregnancy increases the probability of preeclampsia in Omo district in southern Ethiopia: a case-control study. " showed that more of the studied pregnant women had family history regarding preeclampsia. In the same line these results supported by **Vestgaard, et al., (2022)** reporting the study conducted in Denmark about "The impact of anti-hypertensive treatment on foetal growth and haemodynamics in pregnant women with pre-existing diabetes–An explorative study" showed that more of the studied ptegnant women had family history regarding hypertension.

Regarding studied pregnant women sources of information about preeclampsia, the present study represented that, about one third of the studied pregnant women had information about preeclampsia from family, friends, and health team, respectively. While the minority get their information from mass media. In the researcher point of view due to more than one quarter of the studied pregnant women couldn't read and write and about one fifth only could read and write and not know how to use internet and mass media.

The study finding agreed with **Omar, El-Gawad & Mohamadey (2023)** who conducted a quasi experimental research design in Aswan- university hospital, Egypt about " Raising awareness for women with pregnancy induced Hypertension regarding the importance of the antenatal care" reported that less than half of the studied pregnant women take their knowledge from friends, while minority of the studied pregnant women take their knowledge from internet. In the same line with **Ebrahimy, et al., (2022)** who conducted a study in Iraq about " Knowledge About Pregnancy Induced Hypertension Among Pregnant Women Attending Gynecology and Obstetrics Teaching Hospital in Kerbala. " and found that the main source of knowledge by the participants was from friends/relatives followed by health care oroviders, minority of the studied pregnant women take their knowledge from media.

These results disagreed with **Ahmed, et al., (2022)** who carried out their study in Sabzevar Iran about " The Impact of Self-Care Counseling on Quality of Life in Pregnant Women with Gestational Hypertension." reported that the main source of knowledge by the participants was from internet/media followed by health care providers, minority of the studied pregnant women take their knowledge from friends. This difference likely reflects cultural variation between two studies

Regarding the total score of knowledge of the studied pregnant women, the current study result illustrates that most of the studied pregnant women had satisfactory level of knowledge regarding preeclampsia post intervention compared to less than one quarter of the studied pregnant women had satisfactory level of knowledge regarding preeclampsia pre intervention.

From the researcher point of view, this improvement may be related to that the educational sessions affect the knowledge of the pregnant women positively as all women in the sample share in the sessions and become more equipped by the important information about preeclampsia and the instructional guidelines included the needed information about preclampsia in simple, concise and clear language. In addition, the topic of the study is considered vital and very important to pregnant women during pregnancy and postpartum period. So, women were very interested in and gratified during the educational sessions as well as the written brochure supported with pictures which they considered as a reference at any times even.

The current study findings were supported by the results of **Elagamy, et al. (2021)** who evaluated the impact of nursing intervention based on the PRECEDE model on the knowledge and practice of high-risk pregnant women's preventive behavior regarding pre-eclampsia at Tanta and Sohag University Hospitals and found that both immediately and one month after nursing intervention, the mean score of knowledge had statistically significantly increased

Similarly, **Alnuaimi, Abuidhail & Ismail (2020)** conducted research in Amman, the capital city of Jordan to look at how a preeclampsia intervention program affects pregnancy outcomes and awareness of high-risk pre-eclampsia Jordanian women and discovered a significant difference in pre-eclampsia awareness mean scores between the interventional group and the control group.

Moreover, the present study results agreed with **Radha (2022)** who conducted a quasi-experimental research in Chennai in southeast India and evaluated the impact of a structured teaching program on primigravida mothers' knowledge of self-management of pregnancy-induced hypertension and reported that after the structured teaching program, there was a significant improvement in the primigravida women's overall knowledge of self-management of pregnancy-induced hypertension.

Furthermore, the results of the current study were consistent with the results of **Elsaid, et al., (2021),** who assessed the impact of the teaching program on pregnancy outcomes of primipara women with pregnancy induced hypertension in Tanta and discovered that women's knowledge levels had increased as a result of implementing the health teaching program. In the researcher point of view, the results of the current study were in agreement with those of other studies and this may be related to the fact that pre-eclampsia is a serious maternal health issue that hasn't received enough attention in most nations, and could be due to the fact that there is nearly similar socioeconomic situation.in addition to the positive effects of the educational sessions and the educational materials on acquiring detailed information and facilitating the continuity of effective learning in addition to the women's desire to be aware of their disease.

On the other hand, the finding of the current study regarding the total score of knowledge disagreed with **Ojukwu, et al (2021)** who conducted a cross-sectional study titled " Knowledge and awareness of pregnancy-related hypertension and utilization of exercises as its preventive strategies: Survey of pregnant women in Enugu State, Nigeria. Nigerian" which found that more than two third of the studied pregnant women had knowledge regarding pregnancy induced hypertension. Also, **Abate, Wordofa& Dadhi |(2025)** who conducted a cross sectional study entitled " Knowledge of pregnant women towards pre-eclampsia in South Gondar zone, 2023. " located in the Amhara regional state of Ethiopia and reported that more than half of the studied pregnant women had adequate knowledge towards pre-eclampsia. The differences in country context, cultural traditions, study populations, the use of percentage cut-offs, average scores, specific study settings, and assessment tools may account for the disparities in the findings.

Concerning Pregnant women total self-care reported practice regarding preeclampsia pre-and post-intervention, the current study result illustrated that three quarters of the studied pregnant women had adequate level of total self-care reported practices regarding preeclampsia post intervention compared to nearly one third of the studied pregnant women have adequate level of total self-care reported practices regarding preeclampsia pre intervention.

From the researcher point of view, these results may be attributed to lack of awareness of the studied pregnant women about the correct practice for preeclampsia early detection and prevention. This result declined in the post test of the educational sessions which indicates it was effective in improving level of knowledge among the studied pregnant women which subsequently leading to improve their level of practice, promoting a better understanding of the potential maternal and fetal health risks associated with preeclampsia, this model can empower pregnant women to take proactive steps to protect themselves and their unborn fetuses. Heightened education lead to changes in lifestyle habits, also, early detection of preeclampsia.

The current study result was in agreement with **Abd Elhaleem, et al., (2021)** in their study at Tanta and Sohag University Hospitals about " Effect of Nursing Intervention Guided by PRECEDE Model on Knowledge and Practice of Preventive Behavior of High-Risk Pregnant Women regarding Preeclampsia " and clarified that the preeclampsia preventive behavior total practices score of the pregnant women pre and one-month post-intervention had improved to good practices most pregnant women. This reflects the importance and effectiveness of introducing education through PRECEDE Mode that commonly associated with improving practice.

Similarly, a controlled randomized trial, carried out by **Jacob et al. (2022)** to assess pregnant women's knowledge, attitudes, and practices regarding gestational hypertensive syndrome at a public maternity hospital in Fortaleza-CE, Brazil. The study found that following an educational intervention, the pregnant women enrolled in the intervention group demonstrated greater adequacy in relation to preeclampsia preventive behaviors compared to those in the control group. These study findings may be attributed to the effectiveness of the educational sessions based on preventive model in improving the studied pregnant women's knowledge regarding the prevention of preeclampsia which reflected on their practices.

In the same line, the finding of the present study agreed with **Malone, Haj & Kane., (2022)** who conducted a study in Australia about "Reviewing accuracy of first trimester screening for preeclampsia using maternal factors and biomarkers." and revealed that satisfactory practice with highly significant after intervention. Additionally, **Reda, Mostafa& Salem.,**

(2024) in the study about "Effect of Video-assisted Teaching Programs on the Knowledge, Practices, and Attitude of Pregnant Women at Risk for Preeclampsia." illustrated that the preeclampsia preventive behavior total practices score and attitude of pregnant women pre and one month after the intervention had improved to good practices for the majority of pregnant women. From the researcher point of view this may be because intervention may increase pregnant women's self-determination, resulting in a strong commitment to preventing pre-eclampsia behaviors.

Our findings conflicted with those of **Chanda. (2023),** in Zambia who found that pregnant women lacked preventive practices, negative attitudes, and insufficient knowledge. This can be explained by the fact that efforts to lower maternal mortality are seriously hampered by empowerment model through educational session.

Concerning correlation between total pregnant women' knowledge score and total reported practices pre and post- intervention, the current study result represened that there was no statistically significant correlation at pre-intervention between total pregnant women's knowledge, and self-care reported practices when $p > 0.05$. While there was statistically significant positive correlation at post-intervention between total pregnant women's knowledge, and self-care reported practices when $p<0.05$. From researcher point of view that Improving individual knowledge through educational sessions could help improve the self-care practice for early detection of preeclampsia then improve quality of life.

The result of the current study was in agreement with **Elagamy, et al. (2021)** who found that there was no a statistically significant correlation between total knowledge, enabling factors, and reinforcing factors and preventive behavior practices scores of the studied pregnant women regarding preeclampsia pre intervention when P= 0.47* and that there was a statistically significant correlation between total knowledge, and preventive behavior practices scores of the studied pregnant women regarding preeclampsia after one month of nursing intervention strategy implementation when $p < 0.001$*

In the same line, **Reda, Mostafa& Salem., (2024)** revealed that there were highly statistically significant differences at post-intervention in women's overall preeclampsia knowledge, and practices, ($p < 0.001$). Also, **EL Desoky, et al., (2024),** reported a highly significant statistical positive correlation between total knowledge and total self- care reported practices regarding preeclampsia at post-intervention phase ($P\leq 0.001$). From researcher point of view that adequate knowledge about self-reported care practices increased awareness may lead to the ability of women to improve self-care behaviors contribute to improved quality of life.

Furthermore, the current study agreed with **Ahmed, Youness& Hasab Allah., (2022)** pointed out that there was high statistical significant correlation between study group regarding self-care guideline and total knowledge score at posttest with p-value (0.010, 0.000).

Our findings conflicted with Moreover, **Mahmoud, et al., (2023)** in the study at Benha University Hospita, Egypt about " Nursing Intervention for Pregnancy Induced Hypertension Hospitalized and Home Group" and reported that there was a highly statistically significant positive correlation between total knowledge score and total practices score regarding pregnancy induced hypertension in both groups at pre intervention ($P \leq 0.001$). Also, **Elbana, Abd Elhady& Mohammed (2022)** who revealed a highly positive correlation between knowledge and practice scores.

5. CONCLUSION

Based on the current research findings; it was concluded that empowerment model had a significant positive effect on enhancement of knowledge, attitudes and self-care practices of pregnant women for early detection of preeclampsia. Additionally, there was highly significant statistical positive correlation between total knowledge score and total reported practices & total attitude scores regarding preeclampsia at post-intervention phase. Hence, the aim of the study was achieved and research hypotheses were accepted..

6. RECOMMENDATIONS

The following can be recommended based on the findings of the current study:

1. Continuous health education programs should be an integral part of the routine antenatal care for pregnant women regarding preeclampsia can help in providing continuous support and early detection of preeclampsia during pregnancy.

2. Many seminars and awareness campaigns related to preeclampsia should be organized for developing preeclampsia knowledge and self-care measures for prevention and control of it.

3. A manual guide clarifying information about pre-eclampsia should be distributed to the pregnant women.

Further research studies need to be implemented to:

1. Exploring the obstacles facing the health care providers in the implementation of educational sessions about pre-eclampsia in different obstetric settings.

2. Further research should focus on replication of the current study on a larger probability sample is recommended to achieve generalizability

REFERENCES

[1] **Abate, B. A., Wordofa, M. A., & Dadhi, L. S. (2025).** Knowledge of pregnant women towards pre-eclampsia in South Gondar zone, 2023. Scientific Reports, 15(1), 14676.

[2] **Abd Elgwad, F., Mourad, M., & Mahmoud, N. (2021):** Effect of Benson's Relaxation Therapy on Stress and Physiological Parameters among Women with Preeclampsia. Alexandria Scientific Nursing Journal, 23(1), 63-74.

[3] **Abd Elhaleem Ebraheem Elagamy, M., Emad Eldien Hussien Sabbour, M., Kamel Yousef Ali, F., Ebrahim Ahmed, S., & A Shahin, M. (2021).** Effect of Nursing Intervention Guided by PRECEDE Model on Knowledge and Practice of Preventive Behavior of High-Risk Pregnant Women regarding Preeclampsia. Egyptian Journal of Health Care, 12(2), 1298-1314

[4] **Ahmad, inejad, G. S., Khadivzadeh, T., Eftekharyazdi, M., & Esmaeili, H. (2022).** The Impact of Self-Care Counseling on Quality of Life in Pregnant Women with Gestational Hypertension. Journal of Midwifery & Reproductive Health, 10(4),3432-3442.

[5] **Ahmed, E. M., Youness, E. M., & Hasab Allah, M. F. (2022).** Impact of Self-Care Guidelines on Women's Awareness and Identification of Early Signs and Symptoms of Preeclampsia. Minia Scientific Nursing Journal, 12(1), 2-9.

[6] **Ali, S.E.R., Abdraboo, R.A.M., Abdelati, I.H. & Shalaby, N.S. (2021).** Effect of an Educational Program on Modifying Lifestyle among Pregnant Women with Mild Preeclampsia. Scholars International Journal of Obstetrics and Gynecology (Sch Int J Obstet Gynec). 4(8): 316-320. DOI:10.36348/sijog.2021.v04i08.003.

[7] **Alnuaimi, K., Abuidhail, J. & Ismail, H. (2020).** The effects of an educational programme about preeclampsia on women's awareness: a randomised control trial. Int Nurs Rev. 67(4):501-511. doi:10.1111/inr.12626.

[8] **Alsabi FA, Orabi AM, Bajamal EZ (2025)** Knowledge and attitude of pregnant women about preeclampsia in King Abdulaziz Medical City, Western Region: A cross-sectional study. PLoS One 20(5): e0312304. https://doi.org/10.1371/journal.pone.031234

[9] **Aquino, M., Griffith, J., Vattaparambil, T., Munce, S., Hladunewich, M., & Seto, E. (2022).** Patients' and providers' perspectives on and needs of telemonitoring to support clinical management and self-care of people at high risk for preeclampsia: qualitative study. JMIR Human Factors, 9(1), e32545.

[10] **Bohsas, H., Alibrahim, H., Swed, S., Abouainain, Y., Aljabali, A., Masoud, S., ... & Hafez, W. (2024).** Assessing pre-eclampsia awareness among pregnant women in Syria: a cross-sectional study on knowledge and perceptions. BMC Pregnancy and Childbirth, 24(1), 185.

[11] **Botutihe, F., Herdyana, E., & Widiyanto, B. (2025).** The Role of Nurses in Early Detection and Prevention of Pregnancy Complications. The Journal of Academic Science, 2(3), 844-852.

[12] **Buciu, V. B., Șerban, D. M., Olariu, S., Novacescu, D., Cîtu, C., Ciurescu, S., ... & Chiriac, V. D. (2025).** The Impact of Maternal Education on Neonatal Outcomes in Preeclamptic Pregnancies from a Low-Resource Settings. Journal of Clinical Medicine, 14(11), 3937.

[13] **Bukhari, O. F., Naaman, N. A., Bantan, O. I., Attar, R. H., Aloweiny, F. H., Alquzi, R. A., ... & Alshaikhjafar, F. A. J. (2021).** Knowledge of Preeclampsia and its Associated Factors Among Pregnant Women. Pharmacophore, 12(4-2021), 107-111.

[14] **Chanda, T (2023).** The Knowledge, Attitude and Beliefs about Pre-eclampsia and Eclampsia among Pregnant Women at Selected Antenatal Clinics in Kitwe. Journal of Clinical Research, 7(5), 194

[15] **Chang, K. J., Seow, K. M., & Chen, K. H. (2023).** Preeclampsia: Recent advances in predicting, preventing, and managing the maternal and fetal life-threatening condition. International journal of environmental research and public health, 20(4), 2994.

[16] **Ebrahimy, A., Abbood, E., Al Jobori, S. S., & Al Safi, W. (2022).** Knowledge About Pregnancy Induced Hypertension Among Pregnant Women Attending Gynecology and Obstetrics Teaching Hospital in Kerbala. Kerbala Jorunal of Medicine, 12(2).

[17] **EL Desoky, N.A, Abd-Elhakeem Hasneen Aboud, S., Mohamed Abd-Elhakem, E., & Abd-Elwahab Afifi Araby, O. (2024).** Effect of continuous care model on quality of life among women with Preeclampsia. *Journal of Nursing Science Benha University*, *5*(1), 446-461. https://doi.org/10.21608/jnsbu.2024.337827

[18] **Elagamy, M.A.E.E., Sabbour, M.E.E.H., Ali, F.K.Y., Ahmed, S.E. & Shahin M.A. (2021)** Effect of Nursing Intervention Guided by PRECEDE Model on Knowledge and Practice of Preventive Behavior of High- Risk Pregnant Women regarding Preeclampsia. Egyptian Journal of Health Care. 12(2): 1298-1314. doi:10.21608/ejhc.2021.179134.

[19] **Elbana, H. M., Abd Elhady, R. M., & Mohammed, H. R. (2022).** Self-Care Management Program Utilization among Antenatal Mothers with Pregnancy-Induced Hypertension. Journal of Medicinal and Chemical Sciences, 5 (1), 103-115 DOI:10.26655/JMCHEMSCI.2022.1.12

[20] **Elsaid, F. M., Ahmed, M. H., El- Abedin, M. Z. & Elkhayat, I. A. (2021).** Effect of Implementation of Teaching Program on Pregnancy Outcome among Primipara Women Suffering from Pregnancy Induced Hypertension. Tanta Scientific Nursing Journal. 21(2): 55-77. DOI: 10.21608/tsnj.2021.179392.

[21] **Emilda, E., Magfirah, M., Mutiah, C., & Veri, N. (2023).** Midwifery strategies for preeclampsia: enhancing early detection and intervention for optimal maternal health. Path of Science, 9(7), 2015-2022

[22] **Fikadu, K., G/Meskel, F., Getahun, F., Chufamo, N., & Misiker, D. (2020).** Family history of chronic illness, preterm gestational age and smoking exposure before pregnancy increases the probability of preeclampsia in Omo district in southern Ethiopia: a case-control study. Clinical Hypertension, 26, 1-12.

[23] **Gholami, K., Norouzkhani, N., Kargar, M., Ghasemirad, H., Ashtiani, AJ., Kiani, S., Sajedi Far, M., Dianati, M., Salimi, Y., Khalaji, A., Honari, S. & Deravi, N. (2022).** Impact of Educational Interventions on Knowledge About Hypertensive Disorders of Pregnancy Among Pregnant Women: A Systematic Review. Front Cardiovasc Med. 9:886679. doi: 10.3389/fcvm.2022.886679.

[24] **Haile, T. G. et al., (2021).** Determinants of Preeclampsia among Women Attending Delivery Services in Public Hospitals of Central Tigray, Northern Ethiopia: A Case- Control Study. J Pregnancy. 2021:4654828. doi: 10.1155/2021/4654828.

[25] **Jacob, L., Mafetoni, R., Lopes, M., & Shimo, A. (2022):** Knowledge, attitude and practice about hypertensive gestational syndrome among pregnant women: a randomized clinical trial. Texto & Contexto-Enfermagem, 31, e20210018

[26] **Longo, D.L. (2022).** Preeclampsia. N Engl J Med. 386:1817-32.DOI:10.1056/NEJMra2109523.

[27] **Mahmoud, W. M., Mohamed Abd Rabbo, R. A., Hassan Omran, A. A., Abd Elhakam, E. M., & Ali, F. K. (2023).** Nursing Intervention for Pregnancy Induced Hypertension Hospitalized and Home Group. Benha Journal of Applied Sciences, 8(4), 213-224.

[28] **Malone, S. L., Haj Yahya, R., & Kane, S. C. (2022).** Reviewing accuracy of first trimester screening for preeclampsia using maternal factors and biomarkers. International Journal of Women's Health, 1371-1384.

[29] **Mekie, M., Addisu, D., Bezie, M., Melkie, A., Getaneh, D., Bayih, W. A., & Taklual, W. (2021).** Knowledge and attitude of pregnant women towards preeclampsia and its associated factors in South Gondar Zone, Northwest Ethiopia: a multi-center facility-based cross-sectional study. BMC pregnancy and childbirth, 21, 1-9.

[30] **Mohamed, M. H., Awaga, H. A. E., & Sabry, F. A. M. (2025).** Review regarding the Effect of Educational Programs on Maternity Nurses' Knowledge Concerning High-Risk Pregnancy and Maternal Near-Miss Cases. Sohag Journal of Nursing Science, 4(6), 11-20.

[31] **Mohammed, A. R., & Ghafel, H. H. (2022).** Assessment of nurses' knowledge about management of pregnancy with danger Signs. Mosul Journal of Nursing (Print ISSN: 2311-8784 Online ISSN: 2663-0311), 10(2), 319-326.

[32] **Mou, A. D., Barman, Z., Hasan, M., Miah, R., Hafsa, J. M., Das Trisha, A., & Ali, N. (2021).** Prevalence of preeclampsia and the associated risk factors among pregnant women in Bangladesh. Scientific Reports, 11(1), 21339.

[33] **Moulaei, K., Bahaadinbeigy, K., Ghaffaripour, Z., & Ghaemi, M. (2021):** The design and evaluation of a mobile based application to facilitate self-care for pregnant women with preeclampsia during covid-19 prevalence. Journal of Biomedical Physics & Engineering, 11(4), 551.

[34] **Ojukwu, C. P., Ezeigwe, A. U., Madu, O. T., Mba, C. G., & Nseka, E. G. (2021).** Knowledge and awareness of pregnancy-related hypertension and utilization of exercises as its preventive strategies: Survey of pregnant women in Enugu State, Nigeria. Nigerian Journal of Medicine, 30(5), 526-531.

[35] **Omar SOA, El-Gawad NAE, Mohamadey SH. (2023).**Raising awareness for women with pregnancy induced Hypertension regarding the importance of the antenatal care. International Journal of Advance Research in Nursing. 2023;6(1):101-108.

[36] **Parrales-Bravo, F., Caicedo-Quiroz, R., Rodríguez-Larraburu, E., & Barzola-Monteses, J. (2024,).** Acme: A classification model for explaining the risk of preeclampsia based on bayesian network classifiers and a non-redundant feature selection approach. In Informatics (Vol. 11, No. 2, p. 31). MDPI.primigravida mothers with pregnancy-induced hypertension. Int J Midwifery Nurs Pract. 2(2):39-42.

[37] **Parrales-Bravo, F., Cevallos-Torres, L., Vasquez-Cevallos, L., Caicedo-Quiroz, R., Tolozano-Benites, R., & Gómez-Rodríguez, V. (2025).** A Review of the Use of Data Analytics to Address Preeclampsia in Ecuador Between 2020 and 2024. Diagnostics, 15(8), 978.

[38] **Radha, C. (2022).** Effectiveness of structured teaching program on knowledge regarding management of self among primigravida mothers with pregnancy-induced hypertension. Int J Midwifery Nurs Pract. 2(2):39-42.

[39] **Reda, D. M., Mostafa, S. S., & Salem, S. G. A. (2024).** Effect of Video-assisted Teaching Programs on the Knowledge, Practices, and Attitude of Pregnant Women at Risk for Preeclampsia. International Egyptian Journal of Nursing Sciences and Research, 4(2), 271-285.

[40] **Sabry, A., Atia, A., & Abd Elkhalek, K. (2021):** Effect of PRECEDE Model Educational Program on Nurses' Knowledge and Attitude toward Health Promotion of preeclampsia. Egyptian Journal of Nursing and Health Sciences, 2(2), 137-158. doi: 10.21608/ejnhs.2021.196024.

[41] **Sole, K.B., Staff, A.C., Räisänen, S. & Laine, K. (2022).** A substantial decrease in preeclampsia prevalence and risk over two decades: A population-based study of 1,153,227 deliveries in Norway, Pregnancy Hypertension. 28: 21-27. Doi:10.1016/j.preghy.2022.02.001.

[42] **Stitterich, N., Shepherd, J., Koroma, M. M., & Theuring, S. (2021).** Risk factors for preeclampsia and eclampsia at a main referral maternity hospital in Freetown, Sierra Leone: a case-control study. BMC pregnancy and childbirth, 21(1), 413.

[43] **Vestgaard, M., Al-Saudi, E., Ásbjörnsdóttir, B., Nørgaard, L. N., Pedersen, B. W., Ekelund, C. K., ... & Mathiesen, E. R. (2022).** The impact of anti-hypertensive treatment on foetal growth and haemodynamics in pregnant women with pre-existing diabetes–An explorative study. Diabetic Medicine, 39(4), e14722.

[44] **Yevgenevna, S. O. (2025).** PREDICTION OF PREECLAMPSIA DEVELOPMENT IN PREGNANT WOMEN WITH OVERWEIGHT AND OBESITY. Web of Medicine: Journal of Medicine, Practice and Nursing, 3(5), 561-568.