- ***Basic Research***

Effect of PRECEDE Model Educational Program on Nurses' Knowledge and Attitude toward Health Promotion of preeclampsia.

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Abstract

Introduction: Preeclampsia is considered one of the major obstetrical problems during pregnancy in developing countries, that increase maternal mortality and preterm birth in the world. **Aim:** To evaluate the effect of PRECEDE model educational program on nurses' knowledge and attitude toward health promotion of preeclampsia. Design: Quasi-experimental research design pre-post-test was conducted in this study. Settings: In Obstetric and Gynecological Departments at Sohag University Hospital.

Sample: A purposive sample of 30 nurses. **Tools:** (1) Structured interviewing questionnaire, (2) Knowledge assessment questionnaire guided by PRECEDE model (Predisposing, Enabling, and Reinforcing Questionnaire) (3) attitude assessment questionnaire.

Results: Level of knowledge, enabling factors and reinforcing factors have been increased with statistical significance immediately and after one month of PRECEDE model educational program. Nurses had good attitude toward health promotion of preeclampsia one-month post PRECEDE model educational program in comparison to the pre-educational program. There was a statistically significant relationship between knowledge, enabling, reinforcing factors score and attitude scores of health promotion of preeclampsia throughout the program phases. **Conclusion:** PRECEDE model educational program for nurses was effective in improving their knowledge and attitude toward health promotion of preeclampsia.

Recommendation: PRECEDE model educational program toward health promotion of preeclampsia should be incorporated with the antenatal care for pregnant women in the study setting .

Key words: Attitude, Educational program, Health promotion, Nurses, preeclampsia, PRECEDE model

Introduction

Preeclampsia is the great common hypertensive disorder during pregnancy, it is a major cause of maternal mortality and morbidity, preterm birth, intrauterine growth retardation, and perinatal death worldwide. It has been predictable which preeclampsia represents 2-8% of pregnancies globally and is considered to be the third cause of maternal death. Preeclampsia classified to two types mild and sever. Preeclampsia is considered pregnancy-specific disease which descripted by hypertension and proteinuria that occurs after the 20th week of gestation for women with normal blood pressure and no protein in their urine before pregnancy. Approximately 15.9% of pregnant and postpartum women deaths result from preeclampsia disorder. In Iranian, about 1% to 8 % of women suffer from preeclampsia **(Irion et al., 2017).**

Preeclampsia screening program aimed to determining predisposing factors for preeclampsia before the occurrence, maternal signs and symptoms of preeclampsia. Screening tests during pregnancy are concentrating on pathologies which related to biomarkers concentrated in the maternal blood and placental involvement and perfusion **(Tsiakkas, 2016).** The risk factors of preeclampsia which can be determined at or before 16 weeks' from gestation such as the previous history of preeclampsia, history of fetal growth, history for placenta abruptio intrauterine growth retardation, history for stillbirth, primigravida, maternal age over 35 - 40 years, obesity, pre pregnancy diabetes mellitus, chronic renal, hepatic disease, chronic hypertension, history for assisted reproduction, systemic lupus erythematousand multi-fetal pregnancy **(Bartsch, 2016).**

Although many pregnant women with preeclampsia have healthy babies without any problems, but sometimes, preeclampsia can be dangerous for both the mothers and their babies. Preeclampsia can affect the women about each organ system, lead to more complications for mother such as cardiovascular, cerebrovascular, respiratory, hepatic, renal, uterine, HELLP syndrome and neurologic disorders during pregnancy **(Abalos, 2014).** According to babies can affect the arteries which carrying the blood to the placenta, fetus receives low amount of oxygen and nutrition, which causes low birth weight, stillbirth, slow body growth, pre-maturity and breathing complications after they are born. Preeclampsia also raising the possibility of the pre matures separating the placenta from the uterus before delivery (placenta abruption). Also, may lead to Eclampsia (Preeclampsia with seizures) which happens if Preeclampsia is uncontrolled **(Alkema et al., 2016)**

Women who do not have antenatal care are liable for die from complications of preeclampsia 7 times than women who receive prenatal care effectively. Although preeclampsia is not preventable in all cases, but, many deaths result from it can be prevented. To minimize preeclampsia-related deaths, proper antenatal care must be introduced to every woman. Close monitoring, early detection and early treatment of preeclampsia are vital in decrease mortality related to this disease (**Hadian et al., 2018**)

Prevention of preeclampsia include primary, secondary, or tertiary (**Alkema et al., 2016**). Primary prevention focuses on the pregnant women at high risk for preeclampsia through avoiding or prevention pregnancy for this women, primary prevention includes modifying lifestyle, promote women's healthy nutrients intake to eliminate the occurrence of the disease and reduce the stressors accompanied by pregnancies and promote mental health in women with high-risk pregnancies (**Hadian et al., 2018**). According to women at high risk for preeclampsia, using low dose of aspirin begin at or before 16 weeks of pregnancy, prophylactic use of antioxidants (vitamin C, E), using thromboxane as a vasoconstrictor, using prostacyclin as a vasodilator that responsible for platelet compilation **(Mone, 2016).**

Secondary prevention is dependent on the disruption of known pathophysiological mechanisms of the disease before its development. Secondary prevention focused on providing to high-risk women an effective intervention, as early as it is possible, to avoid the major complications because it helps indicate that antenatal results promote with expected management, assessment of proteinuria must be done through automated strip reading device (**Poon & Sahota, 2019**). Tertiary prevention focuses on using treatment to preeclampsia and its complications. So that the judgment of care can cause minimize premature babies and long hospitalization with high costs for a low birth-weight babies. Seizures can be prevented by the use of magnesium sulfate & antihypertensive drugs. Magnesium sulfate can minimize the rate of preeclampsia, (**Ichikawa K, et al., 2015**).

PRECEDE model is considered one of the major vital and applicable theories in health promotion **(Didehvar et al., 2016)**. It can be applied to design and evaluate health promotion plan. PRECEDE supports for Predisposing, Reinforcing, and Enabling Constructs in Educational/Environmental Diagnosis and Evaluation. The PRECEDE elements can enables the researchers to create a basic to establish the formation of the educational program. The PRECEDE model has been identified as an effective method for establishing and promoting

the stages that are necessary for health improvement. In studies done by **Hosseini et al., (2014) and Hazavei et al., (2012)** they have reported and added the effectiveness of this model and obtained appropriate educational results. Also, Nurses play vital role in preeclampsia management and controlling that include improving guidance and educate women toward evidence-based approaches for reducing preeclampsia risk and its complications. Advising all women in pregnancy to plan and intake a healthy diet with recommended nutrients to achieving a healthy body weight. Improving guidance toward limit and low foods with high sugars and food with added fat and eat a lot of fruits, grains, vegetables, and proteins, don't take like sources of mercury such as shark, swordfish, mackerel, tilefish, and minimizing the intake of another source, tuna, to less than six ounces per week **(Black, 2014)**.

Nurses can help in identification the risk factors and risk groups for preeclampsia through the taking of personal history and complete medical and family history from pregnant women during follow up in the first visit. Nurses also, play important role in educating pregnant women about the dangerous signs of preeclampsia can appear in second trimester of pregnancy and during the postpartum period like headache, nausea, vomiting, epigastric pain, dizziness, visual disturbances, dyspnea, and edema in face and hands. Interruption in blood pressure and increase body weight may due to fluid imbalance accompanied with edema. Maternal evaluation includes physical assessment, laboratory investigations, assessment of finding symptoms, monitoring blood pressure to promote nursing role. In severe preeclampsia, delivery is appropriate anytime within 34 weeks of gestation after corticosteroid administration to promote fetal lung maturity **(American College of Obstetricians and Gynecologists, 2017)**.

Significance of the study:
Preeclampsia defined as a global health problem, which accompanied with high rate of maternal and neonatal morbidity and mortality. determination women at risk for preeclampsia are very necessary through antenatal care follow up, nurses responsible for identifying women at high risk for preeclampsia and educate them how to avoid complications. Preeclampsia can cause minimize premature babies and long hospitalization with high costs for a low birth-weight babies. Women who do not have antenatal care are liable for die from complications of preeclampsia 7 times than women who receive prenatal care effectively. To avoid high prevalence and serious outcomes of preeclampsia especially in Egypt and other developing countries **(Polit and Beck, 2018).** For that, the study was aimed to evaluate the effect of PRECEDE model educational

program on nurses's knowledge and attitude toward health promotion of preeclampsia.

Aim of the study:

To evaluate the effect of PRECEDE model educational program on nurses's knowledge and attitude toward health promotion of preeclampsia.

Research hypothesis:

Nurses's knowledge and their attitude toward health promotion of preeclampsia will be enhanced after PRECEDE model educational program than before

Subject and methods

Design: A quasi-experimental research design pre-post-test was used in this study. Quasi-experimental research is a prospective or retrospective study in which clients self-select or are selected into one of some different treatment groups to compare the real effectiveness and safety of non-randomized treatments **(Maciejewski, 2020).**

Setting: The study was utilized in Obstetric and Gynecological Departments at Sohag University Hospital. They consist of six rooms for sonar, antenatal examination, gynecological examination, lab, nursing staff and medical staff. Also, there was a waiting area for nurses and a lecture room which included an adequate number of seats, and data reveal where the researchers interviewed the nurses to carry out this study.

Subjects:

Sample type: A Purposive sample was used in this study.

Sample size: It included 30 nurses working in the Obstetric and Gynecological Departments at Sohag University Hospital

Inclusion criteria: Nurses working in Obstetrics and Gynecology department, who agree to participate in the study

Exclusion criteria: Nurses disagree to participate in the study.

Tools of data collection:

Tool I: Structured interviewing questionnaire. The questionnaire was developed by the researcher after reviewing of literature, this tool was included:
Part I: Nurses' socio-demographic data such as age, sex, education, experience years.

Tool II: Knowledge assessment questionnaire. **Guided by PRECEDE model questionnaire** (Predisposing, Enabling, and Reinforcing Questionnaire)**,** it was developed by researchers after reviewing the literature (**Green & Kreuter, 2005**), This tool included three parts:
Part I: Predisposing factors assessment: which included nurses' knowledge toward preeclampsia: it was developed by the researchers after reviewing of the related literature to determine the level of nurses's knowledge toward preeclampsia and their source of information. It included 6 questions as definition, predisposing factors, signs, symptoms, complications, adverse outcomes for mother, baby, and management & prevention.

Scoring system: The scoring system was calculated as: 2 score for the correct answer and 0 score for the incorrect answer. The total scores ranges from $0 - 12$. It was categorized for each nurse according good, moderate and poor knowledge as regards: poor < 50 %. Moderate was from 50% to 75 %, and good >75 %.

Part II: Enabling factors assessment: Are included knowledge toward available health facilities and informational resources. It included 2 questions such as do you previously receive an educational program toward preeclampsia, do you know available confiscations and facilities for preeclampsia prevention and management.

Scoring system: The scoring system was calculated as: A response of Yes to each question was given one score and a response of No to each question give 0 score.

Part III: Reinforcing factors assessment: Are focused on knowledge of nurse about importance of support from family and health care providers for pregnant women with preeclampsia. It included 2 questions such as Should the pregnant women with preeclampsia have psychological support from their families? Should the pregnant women with preeclampsia have psychological support from their health care providers?

Scoring system: Scores were given in this way: A response of Yes to each question was received one score and a response of No to each question gave 0 score.

Tool III: *Attitude assessment questionnaire*

developed by the researchers. It included five questions such as : Do you think psychological stress causes preeclampsia? Do you think food with high salt causes preeclampsia? Do you think exercises causes preeclampsia? Do you think overweight causes preeclampsia? Do you think regular medical follow-up is necessary?

Scoring system: The scoring system was calculated as: (neutral =0, disagree =1, and agree = 2) . A total score equal 10. Total attitude scores as ≥ 5 considered positive attitude, score < 5 considered negative attitude.

Validity of the tools: The content validity was tested for clarity, comprehensiveness, appropriateness, and relevance and reviewed by five experts in the obstetrics and gynecology nursing field . Modifications were done according to the panel judgment to ensure clarity of sentences and appropriateness of the content.

Reliability of the tools: The reliability of the tools was assessed through Cronbach's alpha test α= 0. 89. The tools' reliability was estimated by using the Pearson correlation coefficient test to compare variables. The Pearson correlation coefficient for the variables ranged between (P. < 0.5) and (P. < 0.001), which indicated a highly significant positive correlation between variables of the subjects.

Ethical considerations:

Before starting the research, ethical approval was obtained from the scientific research ethical committees of the faculty of nursing, Sohag University Hospital. The researcher met both medical and nursing directors of the selected settings to clarify the purpose of the study and take their approval. Written consent was obtained from every nurse to participate in the study after the objective of the study was explained to them. The researcher informed the nurses that, the study was voluntary, they were allowed to not participate, and they had the right to withdraw from the study at any time, without giving any reason. Moreover, they were assured that their information would be confidential.

Pilot study

A pilot study was carried out on 10% of the sample (3) nurses to observe the clarity and testing of the feasibility of the research process needed for modifications to develop the final form of the tools. Nurses involved in the pilot study were excluded from the study. The researchers were done modifications for some items in the form of Arabic translation to make them more suitable for nurses' perception. The pilot sample was excluded from the main research sample.

PRECEDE model educational program was applied through:

A- **Preparatory phase:** Contents of the PRECEDE model educational sessions about preeclampsia were designed. Several methods of education were used (videos, attractive pictures, and brochure) were prepared. Brochure was written in Arabic language, covered all items of the sessions, printed out toward the sample size, and given to them.

B-**Assessment phase:** Data were collected from the beginning of June 2021 to the end of June 2021. Follow up after one month, in Obstetrics and Gynecology in Sohag University Hospital, through three days per week. The researchers was attended to the hospital at 9:00 am to 1:00 pm . Data was collected by all the researchers, and they introduced themselves to the nurses. Clear and simple explanations about the aim, objectives and nature of the study were discussed by the researchers with nurses. The structured interviewing questionnaire was used to collect nurses 's characteristics. During this phase, nurses 's predisposing factors, enabling factors, reinforcing factors were assessed depend on Predisposing, Enabling, and Reinforcing Questionnaires (PRECEDE Model questionnaire) and also the attitude towards preeclampsia by using attitude questionnaire regarding preeclampsia prevention as a pretest. The questionnaires were distributed to nurses and collected after filling.

C- **Implementation phase:** It included the application of PRECEDE model educational program with concerned with predisposing factors included knowledge toward preeclampsia. Enabling factors are outlined as those which assist the advancement of the implementation of the health action like the resources and supportive approaches which are necessary to conducting behavior. In this study, the enabling factors are knowledge regarding available health facilities and informational resources (Educational sessions and Brochure), the

reinforcing factors are focused on knowledge of nurse about importance of support from family and health workers for pregnant women with preeclampsia

PRECEDE model Two educational sessions:

Toward PRECEDE model educational program about health promotion of preeclampsia given to nurses. One theoretical and one practical session were introduced to them in two groups of 15 nurses for each group, one session every one weeks at the lecture's room at the obstetric and gynecological department of South valley university Hospital in the form of lectures and group discussion with a duration of 45 - 60 minutes for each session. In the

First session: Theoretical session included (definition of preeclampsia, risk factors, symptoms, complications, and management & prevention were discussed. Also education toward enabling factor that included education toward resources and supportive approaches that are necessary to conducting behavior and reinforcing factor that included the importance of support from health care supervisors.

Second session: Practical session included (discussion of nurses about knowledge of pregnant women's practices of prevention preeclampsia like taking rest through the day, dietary salt restriction, calcium, and vitamin D supplementation in pregnancy. Exercise at least 30 minutes daily, performance with activities that make relaxation (watching TV), taking the medication regimen as prescribed by a physician, regular antenatal follow up with a physician, Taking enough sleep (8 hours or more per day). Nurses training on monitoring of blood pressure, measuring body weight, checking protein in urine were done for pregnant women with preeclampsia. At the end of each session, the important points were reviewed. The educational sessions were repeated to each group of nurses. Each nurse was provided with the educational brochure at the end of the first session as a guide and was informed about the time of the next session

The Evaluation phase: The effect of PRECEDE model educational program was evaluated immediately and after one month after implementation phase using the same Tools.

Administrative design: An Approval was obtained from the deans of faculties of nursing and the head of Obstetric and Gynecological department at Sohag University Hospital to conduct this study.

Statistical Analysis:

Statistical Package for Social Sciences (SPSS) version 21 was used for statistical analysis of the obtained data. Data presented using descriptive measures in the form of a number, percentage, mean and standard deviation. Chi-square test used for the differences between variables pre and post-educational program. Pearson correlation test was used to the association between variables. The Cronbach's alpha was used to assess the reliability of the second, third tool.

Results

Table (1) reveals the distribution of nurses regarding to their personal characteristics and job description. According to age, about half (50%) of the nurses aged between 20 to < 30 years, whereas the nurses were in the age of 50 years or more represented (10%) of the subjects. As regard the educational level, the majority of the nurses (83.3%) had nursing diploma, the nurses who did not have certificate of specialization represented (10 %). The mean years of experience in nursing of the nurses were around 10.9±8.3.

Table (2) Shows the distribution of the effect of PRECEDE model educational program on nurses's knowledge about (Definition, types, incidence, high risk groups, investigations of mother and baby, complications of mother and baby of preeclampsia, that was assessed at different timings of the study. These were highly statistically significant differences (p<0.0001) in all items according nurses's knowledge (predisposing factor) post educational program compared with pre-educational program. The most points enhanced were according to definition, investigations of infant and complications of mother, this became 100.0% immediately post-program and stilled at the same level at follow-up test after one month. Also, there were highly statistically significant difference (p<0.0001) between pre and post educational program according to knowledge of nurses about treatment, dose of magnesium sulfate and nurse's role, The most point improvement was in the score of knowledge about mg sulfate, that became 100.0%, 96.7% in the post-program and follow-up test, the score generally slightly decline at 1- month follow-up, compared to the immediate post-test. However, the levels were still significantly higher than the pre-program levels.

Table (3) displays the distribution the effect of PRECEDE model educational program on nurses's knowledge about enabling, and reinforcing factors, the enabling, and reinforcing factors score toward preeclampsia was low pre-educational program compared with there was an increase in the score of

enabling and reinforcing factors score with highly statistical significance differences (p<0.0001) immediately and after one month of educational program.

Figure (1) shows effect of PRECEDE model educational program on nurses's attitude, there were highly statistical significance differences (p<0.0001) between nurses's attitude before and after program, majority of nurses (75%) had negative level attitude about health promotion of preeclampsia before program compared with the most (95%) of nurses had positive attitude after program.

Table (4) clears the correlations between nurses's knowledge score and duration of their experiences, there were highly statistical significant differences between nurses' knowledge before the program and duration of their experience.

Table (5) Illustrates the Correlation between total knowledge, enabling factors, and reinforcing factors and nurses's attitude scores regarding preeclampsia pre and after one month of nursing intervention strategy implementation, there were highly statistically significant differences (p<0.0001) between total knowledge, enabling factors, and reinforcing factors and nurses's attitude scores regarding preeclampsia pre and after one month of nursing intervention strategy implementation.

Table 1: Distribution of nurses according to socio demographic history and job description

Socio demographic data	N	%
Age		
< 20	3	10
20- < 30	15	50
30-< 40	4	13.3
40-<50	5	16.7
> 50	3	10
Educational level:		
Nursing diploma	25	83.3
Technical of nursing	3	10
Faculty of nursing	2	6.7
Certificate of specialization:		
Yes	27	90
No	3	10
Duration of experience:		
Less than 10	15	50
10- < 20	6	20
20 - < 30	5	16.7
More than 30	4	13.3
Mean±SD	10.9±8.3	

Table 2: Effect of PRECEDE model on nurses's knowledge about predisposing factor of preeclampsia

Socio demographic data	Pre		Post		Follow up		Pre-post	Pre-follow up
	N	%	N	%	N	%	p-value	p-value
Definition of preeclampsia	14	46.6	30	100	30	100	0.0001	0.0001
Types of preeclampsia	5	16.6	30	100	28	93.3	0.0001	0.0001
Incidence of preeclampsia	4	13.3	29	96.7	28	93.3	0.0001	0.0001
Risk factors of preeclampsia	3	10	29	96.7	28	93.3	0.0001	0.0001
Investigations for women suffering from preeclampsia	15	50	30	100	27	90	0.0001	0.0001
Investigation needed for fetus	12	40	29	96.7	27	90	0.0001	0.0001
Complications of preeclampsia for pregnant mother	10	33.3	30	100	28	93.3	0.0001	0.0001
Complications of preeclampsia on fetus	10	33.3	30	100	28	93.3	0.0001	0.0001
Mg sulfate causes	15	50	29	96.7	29	96.7	0.0001	0.0001
Mg sulfate doses	16	53.3	29	96.7	29	96.7	0.0001	0.0001
Mg sulfate toxicity	14	46.6	29	96.7	29	96.7	0.0001	0.0001
Nursing role for management of preeclampsia	10	33.3	30	100	27	90	0.0001	0.0001

Table 3: Effect of PRECEDE model on nurses's knowledge about enabling and reinforcing factors

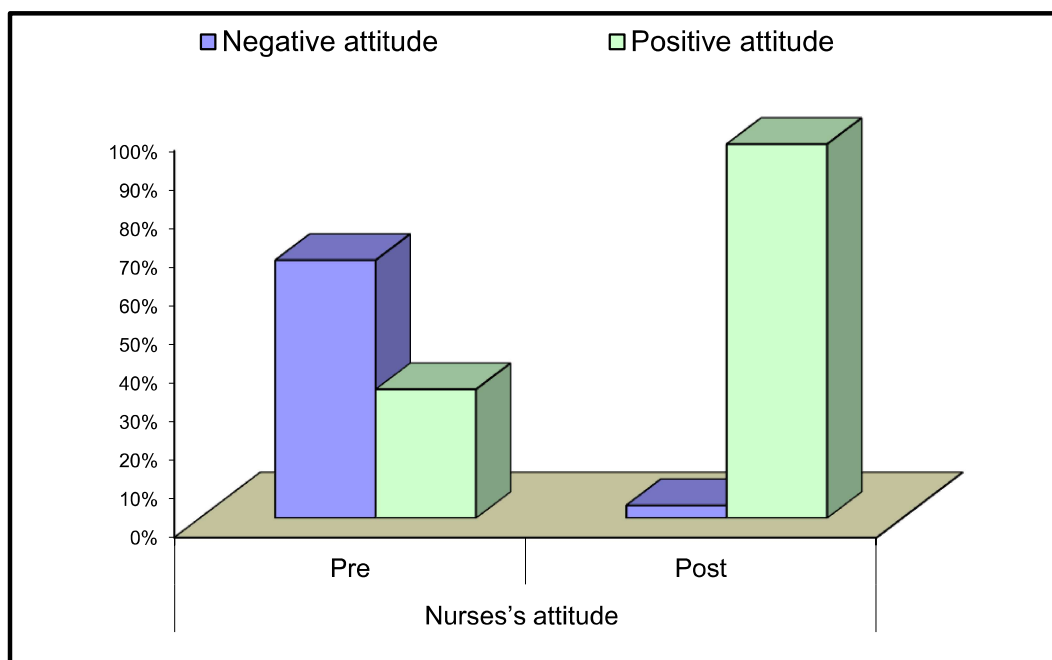|	Pre		Post		Follow up		Pre-post		Pre-follow up
Enable and reinforcing factors	N	%	N	%	N	%	0.0001P.P　　　　　p. value		p. value
Enabling factor	14	46.6	30	100	30	100	0.0001		0.0001
Reinforcing factor	15	50	30	100	27	90	0.0001		0.0001

Fig 1 : Effect of PRECEDE model program on nurses's attitude about health promotion of preeclampsia

Table 4: Correlation between nurses' level of knowledge and duration of their experience

Items	Pre		Post		Follow up	
	Less than 10 years (N 16)	10 years or more (N 14)	Less than 10 years (N 16)	10 years or more (N 14)	Less than 10 years (N 16)	10 years or more (N 14)
Total satisfactory knowledge score (%)	23.6%	28.7%	93.3%	90.0%	84.6%	79.7%

Table 5: Correlation between knowledge, enabling factors, and reinforcing factors and nurses's attitude scores toward preeclampsia pre and post PRECEDE program

Knowledge	Attitude	
	Pre p. value	Post p. value
Pre	0.47	
Post		0.001

Discussion

Preeclampsia is common through the world especially in developing countries. It is accompanied with obvious maternal and fetal morbidity and mortality through worldwide. It is a significant cause of death in 10% of all pregnant women. Nurses have vital and proper role in the prevention of complication of preeclampsia such as early detection and early management of these disorders to decrease the negative outcomes in both mother & infant through attending the ante-natal clinic for follow up during pregnancy. Also, cooperative works of all members of the health care providers as well as appropriate self-care practices of women with preeclampsia is needed. The nurse should be knowledgeable and highly skillful in promoting nursing practice toward women's needs and problems to enhance their lives **(Neer et al., 2013).**

Therefore, this study was done to promote nurses, as healthcare providers, with the knowledge and skills necessary to provide care to the women with preeclampsia.

In our study revealed about half (50%) of the nurses aged between 20 to < 30 years, whereas the nurses were in the age of 50 years or more represented (10%) of the subjects. As regard the educational level, most of the nurses (83.3%) had nursing diploma, the nurses who have certificate of specialization represented (90.0%). The mean years of nurses's experience in nursing were 10.9±8.3. These findings agree with **BAHY et al, 2013** who conducted study about "Effect of Educational Program for Nurses regard Pregnancy Induced Hypertension on their Knowledge in Port Said Hospitals " who added half of the nurses (50%) were in age group between 20 to less than 30 years, while those aged 50 or more were 6.7% of the nurses. The majority of the nurses (86.7%) had nursing diploma and (6.7%) had not certificate of specialization. The mean years of experience in nursing of the nurses were 10.8±9.3.

According to the nurse's knowledge about definition and types of preeclampsia pre the PRECEDE model program, it was noticed that more than half of nurses did not answer the correct answer. This poor of knowledge may be due to their level of education. This result is agreed with (**Simpson and Greenhan, 2001),** who conducted study about "Association of Women's Health, Obstetric and Neonatal Nurses" who revealed that terminology used to describe the pregnancy induced hypertension is causing confusion for health care workers.

According to the finding of our study that there is poor of knowledge toward the incidence of preeclampsia. Pre the PRECEDE model educational program, nurses didn't have knowledge about the complications and severity of the disease to take their precautions or preventive measures. This is similar with (**Churchill & Beevers**, 2013), who conducted study about "Hypertension during pregnancy " added that prevention of a disease should require an intimate understanding of the pathophysiology and incidence of the disease, and an effective management and treatment.

According to nurses' knowledge toward signs and symptoms of mild and sever preeclampsia, it was noticed that there is poor of information toward signs and symptoms of preeclampsia pre the PRECEDE model program. This may be due to the nurses did not attend conferences, workshops and new courses about preeclampsia. This finding consistent with the findings of (**Tawfek**, 2002), who done study about "Analysis of Levels and Differentials of Hypertensive Disorders

during Pregnancy and Implementation for Nurses Training. Faculty of Nursing, Alexandria University "added that the maternity nurses mentioned some signs and symptoms while more than did not mention.

Nurse's knowledge toward maternal and fetal investigations, it was noticed that, before application of the PRECEDE model program, about half of nurses gave correct answers, while, after the PRECEDE model program, the most of nurses gave complete and correct answers. This result supported by (**Tawfek, 2002**), who revealed that lack of nurse's knowledge toward fetal investigations. Before the educational program one third of nurses gave incorrect answers, while after the educational program, more than three-quarters of them gave complete and correct answers.

This study revealed that, about half of nurses gave incorrect answers about drugs given for women with preeclampsia before starting of the PRECEDE model program, but, after the PRECEDE model program, the most of nurses gave complete and correct answers about the drugs needed to treat preeclampsia. This may be due to inadequate information and lack of training program service for nurses. This results in disagree with (**Tawfek, 2002**), who noticed that majority of nurses had correct answers about medications given for women with PIH before the educational program. This may be due to the fact that nurses have their knowledge during their work experiences.

Regarding nurses' knowledge about magnesium sulfate (MgSo4),it was found that, about half of nurses didn't have information before the PRECEDE model program according doses, signs of MgSo4 toxicity, treatment of MgSo4 toxicity and nursing role during administration of MgSo4. But after the PRECEDE model program, the most of nurses revealed satisfactory knowledge related to these items. These results are the same line with **(Gorier et al, 2014)**, who done study about "Foundations of Material Newborn Nursing" added that nurses must be knowledgeable of MgSo4 actions, indications of MgSo4, doses and route of administration, sides effects and nursing role of MgSo4 treatment. Also these results agreement with **(Siba.,2003),** who conducted study about " Diagnosis and Management of Gestational Hypertension and Preeclampsia in pregnancy" added that. Magnesium sulfate. Its use has been standardized, it possible and simple to give, as well as to control its effects and side effects.

The results of the present study revealed that the knowledge, enabling, and reinforcing factors score regarding preeclampsia was increased in the level of knowledge, enabling, and reinforcing factors scores with statistical

significance immediately and after one month of PRECEDE model educational program. This is evidence to the positive effect of PRECEDE model educational program. These findings consistent with results of a study reported by (**Neer et al., 2013),** about " Dosage Effect of antenatal Home Visiting on Pregnancy Outcomes in At-Risk, First-Time Mothers" and added that application of these model, is an proper solution for enhancing pregnancy outcomes, mother and fetus health through providing awareness of the mother and providing accessible health care. Also, these findings are in the same line with a study done by **Wallis et al., (2013)**, who done study about "The effect of antenatal education on improved outcomes among pregnant women with hypertensive disorders during pregnancy" and revealed that sufficient knowledge about any problem during pregnancy permits pregnant women to identify any signs and symptoms that leading to early diagnosis and treatment, that may prevent complications and minimize morbidity and mortality. This result is similar with **John & Kibusi, (2020)**, in East African about "Knowledge on Prevention and Management of Preeclampsia and Eclampsia among Nurses in Primary Health Settings" and added that education helps in the early detection and early prevention of pre-eclampsia and is managed to enhance maternal and neonatal health.

The findings of this study added that most of the nurses had a positive attitude regard preeclampsia prevention after PRECEDE model educational program, This result agree with **Ranjbaran et al., (2015)** who done a study about "Sleep Quality Improving among Patients after Coronary Artery Bypass Graft Surgery through Intervention Study Using the PRECEDE model and found that education through PRECEDE Model improves their knowledge that leads to a positive attitude toward the disease.

The results of this study showed that there was a statistically significant relationship between knowledge, enabling factors, reinforcing factors score and attitude toward health promotion of preeclampsia of nurses. These findings are in the same line with, **Farbod et al., (2017)** who conducted study about "the effect of intervention using the PRECEDE model depend on the quality of life in diabetic women" and reported that the mean score of enabling and reinforcing factors significantly increased in the study group compared to the control group. These results are also, similar with **Solhi et al., (2016), Ranjbaran et al., (2015), Sabzmakan et al., (2010),** and **Dizaj et al., (2014)** who reported that implementing intervention using the PRECEDE model could increase enabling and reinforcing factors.

Conclusion:

PRECEDE educational program has an important and improvement effect on the nurse's knowledge regarding predisposing, enabling, reinforcing and attitude toward health promotion of preeclampsia

Recommendations:

- Updating and schedules educational programs must be applied for nurses as routine at the hospital.
- A possibility the basic recommended instructions about preeclampsia, as well as how to advise and educate woman must be available at the department of Obstetric and Gynecology. Establish library with update scientific books and magazines in an Arabic language and budget must be allowed each year for the educational skills of nurses.
- Advise nurses to attend continuing training in the form of workshops, seminars, training programs and review update nursing care practices related to preeclampsia.
- Standardized protocols for treatment and management of preeclampsia must be provided for nurses during their clinical practices.
- Future research should put patients' inputs into consideration and concerned with patient outcomes.
- Study the psychological items of women with preeclampsia. Study items affecting women with preeclampsia self- care practices.

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الملخص العربي

تأثير البرنامج التعليمي من خلال نموذج البريسيد علي معلومات الممرضات واتجاهاتهم تجاه تحسين مستوى الصحة في ماقبل تسمم الحمل

المقدمة: يعتبر ما قبل تسمم الحمل واحدة من أهم المشاكل الصحية التى تؤثر تأثيراً سلبياً على السيدات والأجنة أثناء الحمل وخاصة في الدول النامية والتي تتسبب في زيادة عدد وفيات الأمهات وارتفاع معدل الولادة المبكرة على مستوى العالم. **الهدف:** استهدفت الدراسة تقييم تأثير البرنامج التعليمي عن طريق نموذج البريسيد على معرفة الممرضات وسلوكهم تجاه تحسين مستوى الصحة في ماقبل تسمم الحمل.

تصميم البحث: يعتبر بحث شبه تجريبى اختبار قبلى و بعدى أجرى فى هذه الدراسة.

المكان: أجريت الدراسة بقسم أمراض النساء والتوليد بمستشفى سوهاج الجامعي. أشتملت عينة الدراسة على عدد 30 ممرضة يعملون في قسم النساء و التوليد بعد تلقي موافقتهن الكتابية للمشاركة في الدراسة. أظهرت

أدوات جمع البيانات: تم استخدام ثلاث ادوات لتقييم المعلومات والأتجاهات وسلوكيات الممرضات.

النتائج : أنه يوجد اختلاف جقيقى فى مستوى المعرفة ،عوامل التمكين و عوامل التحفيز و السلوك من خلال مراحل البرنامج الذي أصبح ايجابى فى تحسين معلوماتهم و سلوكياتهم.

التوصيات : كما أوصت الدراسة أن البرنامج التعليمي عن طريق نموذج البريسيد تجاه تحسين الصحة فيما يخص ماقبل تسمم الحمل يجب أن يكون جنبا الى جنب مع متابعة السيدات الحوامل.