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RESEARCH ARTICLE

THE EFFECT OF THE CONTINUOUS CARE MODEL ON SELF-PRACTICES AND QUALITY OF LIFE AMONG PREECLAMPTIC WOMEN

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Abstract

Background: Preeclampsia is a complex maternal health condition that requires ongoing support, effective education, and active involvement of women in managing their health. Implementing a structured Continuous Care Model may help overcome gaps in healthcare delivery, enhance women's self-care abilities, and support better management of health needs throughout the course of the condition. However, its effectiveness in women with preeclampsia has not been well established.

Aim: Wasto evaluate the effect of the continuous care model on self-practice and quality of life among preeclamptic women.

Methods: A quasi-experimental design with purposive sample 100 preeclamptic women was used. The present study was conducted in the outpatient clinics at Ain Shams Maternity Hospital, Egypt. Four validated tools used in the study a structured interviewing questionnaire, women's knowledge questionnaire regarding preeclampsia, self-care reported practices questionnaire regarding preeclampsia, and world health organization quality of life-brief version.

Results There was no statistically significant difference between total knowledge, self care practices and total quality of life among preeclamptic women regarding preeclampsia before implementation of the continuous care model in both groups.

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However, after implementation the study group was had a highly statistically significant improvement of satisfactory level in the total knowledge from 22% to 94%; self-care practices were improved adequate level from 16% to 90%, and the total quality of life was improved high level from 33% to 94%. Versus, the control group had the same percentage before and after implementation

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Conclusions: Implementation of the Continuous Care Model had a positive effect on the knowledge, self-care practices, and health-related quality of life of women with preeclampsia.

Recommendations: Integrate the continuous care model into routine antenatal care services for women diagnosed with preeclampsia to improve self-care practices, adherence to treatment, and quality of life.

Introduction:-

Preeclampsia is a multisystem hypertensive disorder of pregnancy that typically develops after 20 weeks of gestation and is characterized by hypertension with proteinuria or other signs of organ dysfunction. It is classified as mild or severe according to the extent of organ involvement and as early-onset (<34 weeks) or late-onset (≥34 weeks). Major risk factors include primigravity, maternal age <18 or >35 years, a personal or family history of preeclampsia, obesity, genetic predisposition, gestational diabetes, multiple pregnancy, and chronic hypertension (Al Fattah, 2025).

Preeclampsia is associated with serious maternal complications, including preterm birth, eclampsia, placental abruption, postpartum hemorrhage, cesarean delivery, cardiovascular disease, venous thromboembolism, and maternal mortality, as well as adverse neonatal outcomes such as fetal growth restriction, prematurity, birth asphyxia, and neonatal intensive care unit admission. These complications also place a substantial burden on healthcare systems and society (Kashfi, 2025).

Knowledge plays an essential role in the management of preeclampsia, as women's awareness of the condition, warning signs, and self-care practices helps them make informed decisions and seek timely care. Improving women's knowledge through continuous education and support can enhance self-care behaviors and contribute to better maternal outcomes and quality of life (Gulanick & Myers, 2025).

Self-care practices can help pregnant women and healthcare providers take effective measures to control and prevent gestational hypertension and to provide endorsed solutions for improving maternal and neonatal health. Furthermore, quality of life (QoL) is a broad concept that incorporates aspects of social, environmental, economic, and health satisfaction (Zhang et al., 2025).

Quality of life: in preeclampsia refers to the multidimensional impact of the disorder on physical, psychological, social, and functional well-being, reflecting the ability to perform daily activities, manage symptoms, and maintain overall health during pregnancy and the postpartum period. Thus, the goal of healthcare is to improve the QoL. Making QOL changes can be accomplished in part by utilizing educational theories and models (Sherif, et al., 2025).

The Continuous Care Model (CCM): is a structured care approach designed to improve women's awareness, responsibility, and adherence to ongoing care, thereby helping to control disease and prevent complications (Shahbazi, 2025). Because the benefits of educational interventions often diminish without follow-up, integrating continuous monitoring with education may strengthen self-care practices, reduce maternal and neonatal complications, and improve quality of life among women with preeclampsia. The CCM consists of four phases—orientation, sensitization, control, and evaluation—and promotes active participation of women and their families in the care process, enhancing problem-solving and long-term disease management (Turienzo, 2026).

Furthermore, few studies have evaluated the implementation of the Continuous Care Model within routine outpatient antenatal care in Egypt, where the burden of preeclampsia remains considerable. The present intervention differs from previously published CCM interventions by specifically adapting the model to the educational and supportive needs of women with preeclampsia while simultaneously evaluating its effects on knowledge, self-care practices, and quality of life. Generating evidence in this context may support the integration of structured continuous care into maternity nursing practice and improve patient-centred management of preeclampsia.

The maternity nurse plays a crucial role in the care of women with preeclampsia through comprehensive assessment, continuous monitoring, and patient education. Key responsibilities include monitoring maternal blood pressure, assessing for signs of disease progression, evaluating fetal well-being, administering prescribed medications, and identifying potential complications. The nurse also educates women about medication adherence, self-care practices, and warning signs requiring immediate medical attention while providing emotional support and collaborating with the multidisciplinary healthcare team to improve maternal and fetal outcomes (ElShabory et al., 2025).

Significance of the study:-

According to WHO (2025), Globally preeclampsia affects pregnant women more than the 2% average; additionally, in Egypt, it complicates about 6%-8% of all pregnancies and can reach up to 15% in referral centers like university hospitals. Additionally, preeclampsia is a prevalent pregnancy complication that continues to be the primary cause of maternal morbidity and mortality globally, accounting for 50,000 to 70,000 deaths annually. Preeclampsia has been linked to the deaths of up to 500,000 newborns.

In Egypt, the Maternal Mortality Ratio (MMR) has remained at approximately 30–50 deaths per 100,000 live births in recent years, based on modelled estimates up to 2023. Among the direct causes of maternal mortality, preeclampsia is a major contributor, responsible for approximately 47.5% of direct maternal deaths, followed by hemorrhage, pulmonary embolism, and other causes (WHO, 2025; Elshabory, et al., 2025).

Continuous care model promotes women's self-care responsibility, disease management, and prevention of complications. Combining continuous follow-up with education can improve adherence to health behaviors in women with preeclampsia, reduce maternal and neonatal complications, and enhance quality of life (Dickerson et al., 2025).

Although previous studies have investigated the Continuous Care Model among women with preeclampsia, few have evaluated its implementation within routine outpatient antenatal care while simultaneously assessing knowledge, self-care practices, and quality of life. Therefore, this study was carried out to evaluate the effect of the continuous care model on self-practices and quality of life among preeclamptic women.

Independent Variable:-

The continuous care model (CCM)

Dependent Variables:-

- Knowledge regarding preeclampsia.
- Self-practices.
- Quality of life.

Aim of the study:-

The current study aimed to evaluate the effect of the continuous care model on self-practices and quality of life among preeclamptic women.

Objectives:-

1. Assess knowledge for pregnant women regarding preeclampsia management.
2. Assess self-care practices for pregnant women regarding preeclampsia management.
3. Implement continuous care model on women suffering from mild level of preeclampsia.
4. Evaluate the effect of continuous care model on self-practices and health-related quality of life among preeclamptic women.

Research Hypotheses:

1. Preeclamptic women who receive the Continuous Care Model will have significantly higher knowledge regarding preeclampsia than those receiving routine care.
2. Preeclamptic Women who receive the Continuous Care Model will demonstrate significantly better self-care practices than those receiving routine care.
3. Preeclamptic Women who receive the Continuous Care Model will report significantly better health-related quality of life than those receiving routine care.

Methodology:-**Research Design: -**

A quasi-experimental design (pre-test and post-test) was used to achieve the study aim.

Research Setting: -

The current study was conducted in the outpatient antenatal clinics of Ain Shams University Maternity Hospital, a tertiary teaching hospital affiliated with Ain Shams University, Cairo, Egypt. The hospital is one of the largest

referral centres for maternal and fetal healthcare in Egypt, providing comprehensive antenatal, obstetric, and gynaecological services to women from Cairo and the surrounding governorates. The outpatient antenatal clinics offer routine prenatal care as well as specialised follow-up for high-risk pregnancies, including women diagnosed with hypertensive disorders of pregnancy such as preeclampsia. These clinics receive a large number of pregnant women daily, making them an appropriate setting for recruiting eligible participants and implementing the continuous care model throughout the study period.

Sample Type: -

A purposive sample of women diagnosed with pre-eclampsia.

Sample size: -

A total of one hundred pre-eclamptic women were recruited in the study over a period of six months. Additionally, the sample size was determined using G*Power software (version 3.1.9.7) for an independent two-group comparison. Based on a significance level (α) of 0.05, a statistical power of 80%, and an effect size derived from a previous comparable study, the minimum required sample size was calculated. To account for potential attrition, 100 preeclamptic women (50 per group) were recruited.

Sample technique: -

Eligible women with preeclampsia were consecutively recruited from the outpatient clinics of Ain Shams University Maternity Hospital according to the predefined inclusion and exclusion criteria. To minimise contamination between groups, the first 50 eligible participants were assigned to the control group, followed by the subsequent 50 participants who received the Continuous Care Model intervention according to the following inclusion and exclusion criteria.

Inclusion criteria:-

- Women diagnosed with preeclampsia (systolic blood pressure >140 mmHg and diastolic blood pressure > 90 mmHg with proteinuria $+ 2$ in urine test strip).
- Gestational age 20 to 34 weeks.
- Literate (Can read and write).
- A single viable fetus.

Exclusion criteria: -

- Women with other high-risk pregnancies.
- Attendance of a previous equivalent intervention.

Blinding:-

Due to the nature of the Continuous Care Model intervention, blinding of participants and the researcher delivering the intervention was not feasible. Outcome data were collected using standardized instruments administered according to the same procedures for both groups. Although the absence of blinding may have introduced performance and detection bias, the use of validated measurement tools and standardized data collection procedures was intended to minimize potential bias.

To maintain intervention fidelity, the Continuous Care Model was implemented using a standardized educational protocol. All participants in the intervention group received the same educational content, teaching materials, and follow-up procedures according to a predetermined schedule. The intervention was delivered by the same researcher using consistent teaching strategies and standardized session content to ensure uniform implementation throughout the study.

Measures:-

Tool (I) Demographics: A structured interviewing questionnaire: The tool was developed by the researcher based on a related literature review) ElShabory et al., 2025; Muhindo et al., 2025; Moustfa, et al., 2024). It consisted of three parts:

Part 1: Sociodemographic characteristics included: age, marital status, educational level, residence, occupation, working specifications, husband occupation, income/month, and type of family.

Part 2: Obstetric history was divided into previous and current obstetric history. Previous history included data related to the number of gravidities and any previous complications during pregnancy, number of parties and any

previous complications during delivery, any previous complications during post-partum, number of abortions, and number of children. Additionally, the current obstetric history included gestational age and the number of antenatal care visits during the current pregnancy.

Part 3: Physical examination contained physical assessment, nutritional assessment, and clinical manifestation. Firstly, physical assessment included maternal systolic and diastolic blood pressure, anthropometric measurements (height, weight, and BMI) were calculated using the formula: Weight (kg) / height (m²) and categorized according to the World Health Organization (2025). Secondly, nutritional assessment included the number of meals/days, composition of meals for 24-hour recall (breakfast, lunch, and dinner). Finally, clinical manifestation included lab investigation (urine analysis, CBC, kidney and liver function) and ultrasound.

- **Tool (II) Knowledge:** Women's knowledge questionnaire regarding preeclampsia: This questionnaire was designed by the researcher after reviewing related literature (Alsabi et al., 2025; Yan and Zhou 2025; Abate et al., 2023). It was used to assess women's knowledge regarding pre-eclampsia through 12 questions in the form of multiple-choice questions, such as (definition, diagnosis, signs & symptoms, risk factors, complications, severity, management and recommendation of pre-eclampsia) written in English language and the research translate to Arabic language to be suitable for women understanding.

Scoring system of knowledge: According to Fondjo et al. (2019) and Desoky et al. (2023), all knowledge variables were weighted according to the items included in each question. Each item was given a score (2) when the answer is correct and a score (1) when the answer is incorrect or is not known. The total score was calculated by the summation of the scores of its items; the range of obtained scores was between 12 and 24. The score of total knowledge was converted into percentages and classified into:

- Satisfactory when the total score was 75% to 100% = score 18 to 24.
- Unsatisfactory when the total score was less than 75% = score 12 to 17.

- **Tool (III) Self-Practices:** Self-care-reported practice questionnaire regarding preeclampsia: The third tool was designed by the researchers based on reviewing the literature of review (ElShabory et al., 2025; Cong et al., 2025; Cowan et al., 2024) to assess self-care-reported practices that women practiced in controlling and managing preeclampsia. It comprised 12 items, measuring blood pressure, weight daily, proteinuria using dipstick daily, recommended preeclampsia diet, drinking water daily, regular physical activity, compliance with prescribed medications, taking rest and sleep, managing and coping with stress, counting fetal kicks daily, recommended antenatal visits, and prescribed supplements.

Scoring system: The items were rated based on a three-point Likert scale: always (score 3), sometimes (score 2), and never (score 1). The range of obtained tool scores was between 12 and 36, with higher scores indicating more engagement in healthy behaviors.

The score of total practices is converted into percentages and classified into:-

- adequate when the total score was 75% to 100% = score 27 to 36.
- Inadequate when the total score was less than 75% = score 12 to 26.

- **Tool (IV) Quality of life:** World Health Organization Quality of Life - BREF (WHOQOL-BREF): The WHOQOL-BREF was adapted from the World Health Organization (2012) and translated into the Arabic language to assess the perception of the QOL among women with preeclampsia. It consisted of 26 items in four domains: Physical health (7 items which included pain and discomfort, medical treatment, energy, discomfort, sleep pattern, ability to perform daily living activities, and work capacity), psychological (6 items which contained positive feeling, self-esteem, thinking, learning, memory and concentration, bodily image and appearance, satisfy with self, and negative feeling), social relationships. In addition to, (3 items which consisted of personal relationships, social support, and sexual activity), and environmental health (8 items included freedom, physical safety and security, physical environment, financial resources, opportunities for acquiring new information and skills, participation in and opportunities for recreation/leisure, home environment, health and social care: accessibility and quality, and transport), and (2 items on overall QOL and general health).

- **Scoring system:** On five-points Likert scale ranging from 1 to 5, each item of WHOQOL-BREF is scored (1) for the lowest, and 5 for the highest agreement with the item). The domain score was calculated using item scores within each domain that ranged between 26 and 130. The mean score of each item will be calculated. Higher scores reflect a better QOL.

- High when the total score was 75% to 100% = score 98 to 130.
- Low when the total score was less than 75% = score 26 to 97.

Tools Validity:-

The content validity of the study tools was assessed by a jury consisting of three experts from the maternal and newborn health nursing department to review the tools for clarity, relevance, comprehensiveness, understandability, and applicability. Also, the tools were rephrased based on the jury opinion and their recommendations: additions, corrections, and modifications of some items were done. The modification done in the tool (I) removed part (3) which was antenatal history and combined with the part (2) obstetric history. Additionally add item (3) in Tool (I) which was physical examination.

Tools Reliability:-

Internal consistency reliability was assessed in the present study tools via alpha Cronbach's reliability analysis to indicate how the items in the instrument fitted together conceptually; with Cronbach's alpha was 0.970 for the knowledge assessment sheet, 0.891 for self-care-reported practice, and 0.978 for WHOQOL- BRREF.

Procedure:-**Ethical Consideration:-**

Official permission to conduct the proposed study was obtained from the scientific research ethics committee of the faculty of Nursing at Capital University (Approved No.42, dated 14 July 2024 code: HUNRSRC 36/42/07/2024). The researcher clarified the aim of the study before starting. Informed consent was obtained from preeclamptic women. The researcher was assured of maintaining anonymity and confidentiality of the subject data included in the study, and all preeclamptic women were informed that the collected data would be used only for the purpose of the present study, as well as for their benefits. Preeclamptic women are allowed to choose whether to participate or not in the study and that the preeclamptic women have the right to withdraw from the study at any time without giving any reason, and also confidentiality of the information was assured.

Pilot Study:-

The pilot study was carried out to evaluate the content validity of the tools used for data collection to find the possible obstacles that might be faced during data collection. It was also used to evaluate the time needed for preeclamptic women to fill out the study tool. The pilot study was conducted on 10% of the total sample size including 10 preeclamptic women (5 in the study group and 5 in the control group) one month before the data collection phase within two days/week for two weeks. No modifications were carried out, so all pre-eclamptic women were included in the study.

Preparatory Phase:-

Approval to conduct the study was obtained from the Faculty of Nursing, Capital University, the Obstetrics and Gynecology Hospital at Ain-Shams (El-Demerdash), and the Scientific Research Ethical Committee. The study purpose was explained to obtain permission and cooperation. A comprehensive literature review was conducted using relevant books, journals, articles, and online sources related to preeclampsia, the CCM, self-care practices, and QOL. This review supported the development of data collection tools and ensured their validity and reliability.

Field work:-

The study was conducted over a six-month period, from the beginning of December 2024 to the end of May 2025, at the outpatient clinics. The total sample consisted of 100 women with preeclampsia, who were randomly divided into two equal groups: a study group (50 women) and a control group (50 women). The researcher attended the outpatient clinics two days per week from 9:00 a.m. to 1:30 p.m. to recruit participants and collect data. For the study group, the CCM was implemented in four phases assessment, planning, implementation, and evaluation.

Assessment Phase (Pre-Test): (Study and Control Groups):-

- Four to five preeclamptic women per week were individually interviewed in the outpatient clinics using the structured interviewing questionnaire.
- Participants were divided into ten subgroups: five control subgroups receiving routine hospital care and five study subgroups receiving the CCM intervention.
- The researcher explained the study aim, obtained informed consent, and ensured participants' voluntary participation and right to withdraw.
- Confidentiality and privacy were maintained, with collected data used solely for research purposes.
- Tool (I) was administered to assess participants' general characteristics and current pregnancy history after clarifying the questionnaire items.

Planning Phase (Pre-Test): (Study and Control Groups): -

- After analyzing the structured interviewing questionnaire and applying the inclusion and exclusion criteria, participants were divided into two groups: the first 50 women were assigned to the control group, and the second 50 women to the study group.
- Tools (II, III, and IV) were administered to both groups as a pre-test to assess women's knowledge, self-care practices, and quality of life using the WHOQOL-BREF questionnaire.
- The questionnaires required approximately 20–30 minutes to complete.
- Data collected during this phase served as baseline information for subsequent evaluation.

Implementation Phase: -

- **Control Group:** Received routine hospital care provided at the outpatient antenatal clinics of Ain Shams University Maternity Hospital. Routine care included obstetric examination, blood pressure measurement, urine protein testing, and medical management as prescribed by the attending obstetrician, with follow-up according to the hospital's standard practice. The control group did not receive the structured Continuous Care Model intervention, educational booklet, or scheduled telephone follow-up. In addition, the researcher provided health education about breast self-examination during outpatient clinic visits.
- **Study Group:** Received the (CCM) through an organized educational program implemented in four stages: **Orientation, Sensitization, Control, and Evaluation.**

Orientation stage: -

- The researcher introduced the CCM and explained its importance in improving maternal and neonatal outcomes among women with preeclampsia. The stage emphasized continuous education, increased patient involvement, improved adherence to care plans, and early recognition of warning signs.

Sensitization stage: -

- The researcher analyzed the pre-test results to identify participants' educational needs and develop the appropriate health education program content.
- Educational materials were prepared, including booklets, PowerPoint presentations, videos, handouts, and pictures. The educational booklet was developed by the researcher based on current evidence and national and international clinical guidelines for the management of preeclampsia. It included information on the definition, causes, risk factors, signs and symptoms, diagnosis, maternal and fetal complications, medication adherence, dietary recommendations, blood pressure monitoring, urine protein testing, fetal movement counting, physical activity, adequate rest, stress management, danger signs requiring immediate medical attention, and the importance of regular antenatal follow-up. The booklet was written in simple Arabic and supported with illustrations to facilitate understanding.
- Various teaching methods were planned and used, including lectures, brainstorming, group discussions, demonstrations, and role play.
- Follow-up schedules were arranged for each participant.

Implementation Stage: -

The 50 preeclamptic women in the study group were divided into 10 subgroups, with 5 women in each subgroup. Each subgroup attended four educational sessions, conducted twice weekly in the outpatient clinic waiting area. Each session lasted approximately 30–45 minutes.

- Session One: Covered information about preeclampsia, including definition, causes, signs and symptoms, risk factors, classification, maternal and fetal complications, preventive measures, and management.
- Session Two: Focused on promoting a healthy lifestyle, including appropriate diet, adequate rest and sleep, and regular physical activity to help manage preeclampsia.
- Session Three: Addressed self-monitoring practices, including blood pressure measurement, daily weight monitoring, detection of proteinuria using urine dipsticks, and assessment of daily fetal movements.
- Session Four: Emphasized stress management techniques, the importance of regular antenatal visits, and adherence to prescribed medications.

Intervention Fidelity

To ensure intervention fidelity, all educational sessions were delivered by the principal researcher using a standardized educational protocol. The same educational booklet, PowerPoint presentations, videos, teaching methods, and session sequence were used for all study subgroups. A structured session checklist was completed

after each session to verify that all planned educational content had been delivered consistently. The duration and frequency of sessions were standardized throughout the intervention period.

Evaluation Stage: -

- Feedback was collected from the preeclamptic women at the end of each session, and their questions and concerns were addressed.
- The researcher conducted follow-up with participants through mobile phone communication after each session.

Adherence Assessment

Participants' adherence to the intervention was promoted through scheduled telephone follow-up after each educational session. During each contact, participants were encouraged to implement the recommended self-care practices, discuss any barriers encountered, and seek clarification when needed. Adherence was further assessed during the post-intervention evaluation using the self-care practices questionnaire and participants' feedback regarding implementation of the recommended self-care practices.

Evaluation Phase:-

- Evaluations were conducted for both the study and control groups to assess the effectiveness of the intervention.
- For the study group, evaluation was performed two months after implementing the CCM to assess changes in women's knowledge, self-care practices, and quality of life using Tools (II, III, and IV).
- The evaluation was conducted through face-to-face meetings or telephone follow-up using the same assessment tools applied during the pre-test.
- The control group underwent the same evaluations at the same time points without receiving the CCM intervention.

Data Analysis:-

Data were analyzed by SPSS version 26.0. To test the effect of the continuous care model (independent variable) and three dependent variables (knowledge, self-practices and quality of life), Quantitative data were presented as mean $\pm$ standard deviation (SD), while qualitative data were expressed as frequencies and percentages.

The following tests were done:-

Chi-square test (χ^2), test of significance was used in order to compare properties between qualitative parameters; Independent- samples T- test of significance was used even comparing between two means; McNemar-Bowker χ^2 test used to analyze paired categorical data with more than two response categories; Cohen's d test is a statistical measure used to determine the effect size, which means it quantifies the magnitude of the difference between two groups or two related measurements; and the confidence interval was set to 95 and the margin of error accepted was set to 5%. So, the p-value was considered significant as the following:

Probability (P-Value):-

- P-Value 0.05 was considered significant.
- P-Value 0.001 was considered as highly significant.
- P-Value 0.05 was considered insignificant.

Results:-

Regression Analysis: PSU Predicting Sleep Disturbances

Table 1: Distribution of the pre-eclamptic women according to their sociodemographic characteristics (n = 100)

Sociodemographic characteristics	Study group (n=50)		Control group (n=50)		χ^2 test	p-value
	N	%	N	%		
Age (years)						
○ 18 – 23	28	56	26	52	0.17	0.92 ^{ns}
○ 24 – 29	14	28	15	30		
○ ≥ 30	8	16	9	18		

Sociodemographic characteristics	Study group (n=50)		Control group (n=50)		χ^2 test	p-value
Mean $\pm$ SD	22.8 $\pm$ 5.2		23 $\pm$ 5.4			
Marital status						
○ Married	43	86	40	80	0.65	0.72 ^{ns}
○ Divorced	4	8	6	12		
○ Widow	3	6	4	8		
Educational level						
○ Primary Education	1	2	2	4	1.72	0.42 ^{ns}
○ Preparatory Education	10	20	10	20		
○ Secondary Education	30	60	28	56		
○ Highly educated	9	18	10	20		
Residence						
○ Urban	21	42	19	38	0.08	0.78 ^{ns}
○ Rural	29	58	31	62		
Occupation						
○ Working	17	34	16	32	0.07	0.80 ^{ns}
○ Not working	33	66	34	68		
If yes, specify:						
○ Involved with heavy effort and stress.	6	35.3	5	31.3		
○ Involves moderate effort and stress.	11	64.7	11	68.8		
Family type						
○ Nuclear	24	48	23	46	0.04	0.83 ^{ns}
○ Extended	26	52	27	54		
Income adequacy						
○ Enough	2	4	2	4	0.79	0.67 ^{ns}
○ Not Enough	48	96	48	96		

χ^2 = Chi-square test. P-value: Level of significance. ns = Non-significant P < 0.05

Table (1): reveals that the mean age of the study and control groups was 22.8 $\pm$ 5.2 and 23.0 $\pm$ 5.4 years, respectively, with no statistically significant difference (p = 0.92). Regarding both groups marital status (86% and 80%, respectively) of the pre-eclamptic women were married; education, (60% and 56%, respectively) had secondary education; residence, (58% and 62%, respectively) lived in Rural areas; occupation, (66% and 68%, respectively) were not working; family type, (48% and 46%, respectively) lived in nuclear families; income, (96% and 96%, respectively) as hardly enough or not enough for living. There were no statistically significant differences between both groups regarding all socio-demographic characteristics (p > 0.05).

Table 2: Distribution of the pre-eclamptic women according to their obstetric history (n = 100)

Variables	Study group (n=50)		Control group (n=50)		χ^2 test	P-value
	N	%	N	%		
Gravidity						
○ Primigravida	23	46	19	38	0.68	0.71 ^{ns}
○ 2-3	16	32	19	38		
○ ≥ 4	11	22	12	24		
Any previous complications during Pregnancy						
○ Yes	17	63	20	64.5	0.08	0.78 ^{ns}
○ No	10	37	11	35.5		
If yes, specify:						
○ Hemorrhoids	3	17.7	2	10		
○ Pre-eclampsia	13	76.5	16	80		
○ Hyperemesis gravidarum	1	5.8	2	10		

Variables	Study group (n=50)		Control group (n=50)		χ^2 test	P-value
	N	%	N	%		
Parity ○ Nullipara ○ 1-2 ○ ≥ 3	24 22 4	48 44 8	21 25 4	42 50 8	1.23	0.54 ^{ns}
Any previous complications during labor ○ Yes ○ No If yes, specify: ○ Bleeding during labor ○ Obstructed labor ○ Fetal distress	15 2 10 3 2	88.2 11.8 66.7 20 13.3	20 3 16 3 1	87 13 80 15 5	0.01 1.02	0.90 ^{ns} 0.60 ^{ns}
Any previous complications during post-partum ○ Yes ○ No If yes, specify: ○ Post-partum hemorrhage ○ Post-partum pyrexia ○ Post-partum depression	15 2 10 2 3	88.2 11.8 66.7 13.3 20	16 7 11 3 2	69.6 30.4 68.7 18.8 12.5	1.95 0.42	0.16 0.81 ^{ns}
Number of abortions ○ No abortion ○ One abortion ○ 2 abortions ○ More than 2 abortions	30 10 7 3	60 20 14 6	25 15 6 4	50 30 12 8	5.36	0.15 ^{ns}
Number of children ○ No Children ○ One Child ○ Two Children ○ More than two Children	25 18 5 2	50 36 10 4	22 17 7 4	44 34 14 8	3.06	0.21 ^{ns}
Antenatal visits during pregnancy ○ 1 – 3 visits ○ 4 – 6 visits ○ More than 6 visits	43 5 2	86 10 4	42 3 5	84 6 10	1.80	0.41 ^{ns}
Gestational age (weeks) Mean $\pm$ SD	22.46 $\pm$ 0.82		22.17 $\pm$ 1.25		t = 1.28	0.29 ^{ns}

ns = non-significant

Table (2): Regarding gravidity, study group 46% compared to 38% in the control group were primigravida, with $p=0.71$; parity, nullipara accounted for 48% of the study group and 42% of the control group; number of abortions, 60% of the study group and 50% of the control group had zero abortions. As for the number of children, 50% of the study group and 44% of the control group had no children respectively; and the antenatal visits, (86% and 84%, respectively), women in both groups had 1–3 visits with no significant difference. The mean gestational age was 22.46 ± 0.82 weeks in the study group and 22.17 ± 1.25 weeks in the control group, with no significant difference. No statistically significant difference between two groups regarding the previous and current obstetric history ($p > 0.05$).

Table (3): Distribution of the pre-eclamptic women according to their physical and physiological measurements (n = 100)

Variables	Study group (n=50)	Control group (n=50)	t-test	p-value
	Mean $\pm$ SD	Mean $\pm$ SD		
Maternal Systolic and Diastolic Blood Pressure (mmHg)	156.8 $\pm$ 8.4	154.8 $\pm$ 7.9	1.18	0.24 ns
	92.4 $\pm$ 6.7	91.8 $\pm$ 6.2	0.46	0.65 ns
Height (cm)	158.9 $\pm$ 2.9	158.4 $\pm$ 3.1	0.80	0.42 ^{ns}
Weight (kg)	68.1 $\pm$ 10.5	68.4 $\pm$ 9.2	0.14	0.89 ^{ns}
Body Mass Index (BMI) (kg/m ²)	26.6 $\pm$ 4.7	26.0 $\pm$ 4.4	0.63	0.53 ^{ns}

ns = non-significant

Table (3): illustrates that there were no statistically significant differences between the study and control groups regarding all maternal anthropometric and hemodynamic variables ($p > 0.05$ for all). The mean systolic blood pressure was 156.8 $\pm$ 8.4 mmHg in the study group and 154.8 $\pm$ 7.9 mmHg in the control group. The mean diastolic blood pressure was 92.4 $\pm$ 6.7 mmHg and 91.8 $\pm$ 6.2 mmHg, respectively. Regarding height, weight, and BMI, the values were comparable between the two groups, with p-values of 0.42, 0.89, and 0.53, respectively.

Table (4): Distribution of the pre-eclamptic women according to their physical examination (n = 100)

Variables	Study group (n=50)		Control group (n=50)		χ^2 test	p-value
Number of meals/days	N	%	N	%	$\chi^2 = 0.94$	0.82 ^{ns}
• One	4	8	3	6		
• Two	24	48	25	50		
• Three	20	40	18	36		
• > Three	2	4	4	8		
Red Blood Cells count (million/mm ³)	4.32 $\pm$ 0.41		4.28 $\pm$ 0.38		t = 0.49	0.63 ^{ns}
Platelet count ($\times 10^3$ /mm ³)	238.5 $\pm$ 44.2		241.3 $\pm$ 48.7		t = 0.28	0.78 ^{ns}

ns = non-significant

Table (4): reveals that (48%) of the study group and (58%) of the control group consumed two meals per day. Regarding hematological findings, the mean red blood cell (RBC) count was 4.32 $\pm$ 0.41 million/mm³ in the study group and 4.28 $\pm$ 0.38 million/mm³ in the control group. The mean platelet count was 238.5 $\pm$ 44.2 $\times 10^3$ /mm³ and 241.3 $\pm$ 48.7 $\times 10^3$ /mm³, respectively. There were no statistically significant differences between the two groups regarding dietary habits and hematological parameters ($p > 0.05$).

Table (5): Comparison between study and control groups regarding the pre-eclamptic women's knowledge about pre-eclampsia before and after the application of continuous care model.

Knowledge items		Study group(n=50)				Control group(n=50)				χ^2 test	p-value
		Correct		Incorrect		Correct		Incorrect			
		N	%	N	%	N	%	N	%		
Definition of pre-eclampsia	Before-application	28	56	22	44	22	44	28	56	1.44	0.23 ns
	After-application	48	96	2	4	22	44	28	56	32.20	0.001**
Causes of pre-eclampsia during pregnancy	Before-application	1	2	49	98	1	2	49	98	0.00	1.00 ns
	After-application	48	96	2	4	1	2	49	98	88.40	0.001**
Diagnosis of pre-eclampsia during pregnancy	Before-application	18	36	32	64	17	34	33	66	0.04	0.83 ns
	After-application	48	96	2	4	17	34	33	66	49.8	0.001**
Signs and symptoms of pre-eclampsia	Before-application	22	44	28	56	19	38	31	62	0.36	0.55 ns
	After-application	49	98	1	2	19	38	31	62	50.44	0.000**
Risk factor for developing pre-eclampsia.	Before-application	1	2	49	98	1	2	49	98	0.00	1.00 ns
	After-application	48	96	2	4	1	2	49	98	88.40	0.002**
Complications of pre-eclampsia for the pregnant the pre-eclamptic women	Before-application	2	4	48	96	2	4	48	96	0.00	1.00 ns
	After-application	28	56	22	44	2	4	48	96	92.31	0.001**
Complications of pre-eclampsia for the fetus	Before-application	48	96	2	4	1	2	49	98	0.02	0.78 ns
	After-application	49	98	1	2	1	2	49	98	92.16	0.002**
Time to experience pre-eclampsia	Before-application	18	36	32	64	2	4	48	96	92.31	0.001**
	After-application	48	96	2	4	1	2	49	98	88.40	0.001**
Severity of pre-eclampsia	Before-application	2	4	48	96	17	34	33	66	0.04	0.83 ns
	After-application	49	98	1	2	1	2	49	98	92.16	0.002**
Prevention or reduce the risk of pre-eclampsia.	Before-application	2	4	48	96	1	2	49	98	0.34	0.56 ns
	After-application	49	98	1	2	2	4	48	96	92.31	0.001**
Diet recommendation to help manage or reduce the risk of pre-eclampsia	Before-application	1	2	49	98	17	34	33	66	0.04	0.83 ns
	After-application	48	96	2	4	1	2	49	98	88.40	0.001**
Management ofpre-eclampsia during pregnancy	Before-application	9	18	41	82	10	20	40	80	0.06	0.80 ns
	After-application	49	98	1	2	10	20	40	80	53.57	0.000**

χ^2 = Chi-square test. P-value: Level of significance. **P < 0.01 Highly significance (HS) ns= not significant

Table (5): illustrates that before the implementation of CCM, women in both groups had unsatisfied knowledge about pre-eclampsia (, as most of them provided incorrect answers across all knowledge items with no statistically significant differences between both groups ($p > 0.05$). However, after the implementation, there was a marked improvement in the study group's knowledge level regarding all items; (94%) in the study group demonstrated correct responses compared with only a few in the control group, with a highly statistically significant difference ($p < 0.001$).

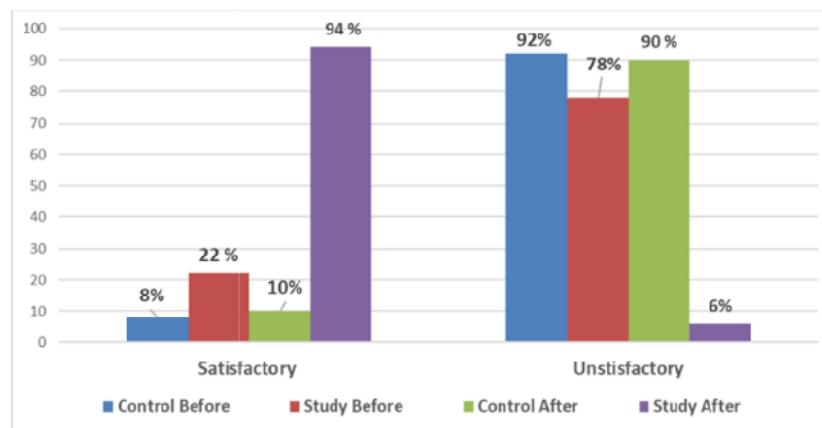


Figure (1): Comparison of Total Knowledge Levels Between Study and Control Groups before and after the application of the continuous care model (n=100).

Figure (1): shows that there was a highly statistically significant improvement in the total knowledge level of the study group (from 22% to 94%) satisfied after the implementation of the CCM ($p < 0.001$), while the control group showed no significant change. After application, there was a highly statistically significant difference between the two groups ($\chi^2 = 145.16$, $p < 0.0001$).

Table (6): Number and percentage of study and control groups regarding the pre-eclamptic women's self-care reported practice about preeclampsia before and after the application of continuous care model.

Self-care reported practice items		Study group(n=50)						Control group(n=50)						McNemar-Bowker MB χ^2 test	p-value
		Always		Sometime		Never		Always		Sometime		Never			
		N	%	N	%	N	%	N	%	N	%	N	%		
Measuring blood pressure daily at any medical service.	Before-application	2	4	18	36	30	60	2	4	18	36	30	60	0.00	1.000ns
	After-application	40	80	8	16	2	4	3	7	15	30	32	64	44.78	0.001**
Checking and recording weight daily.	Before-application	2	4	3	6	45	90	4	8	20	40	26	58	3.78	0.05ns
	After-application	40	80	8	16	2	4	2	4	20	40	28	56	47.22	0.001**
Checking urine for proteinuria by dipstick daily.	Before-application	3	6	2	4	45	90	2	4	18	36	30	60	10.53	0.001**
	After-application	45	90	3	6	2	4	3	7	15	30	32	64	49.12	0.001**
Consuming the recommended preeclampsia diet (high protein, low salt, low fat).	Before-application	5	10	20	40	25	50	4	8	20	40	26	58	0.72	0.395ns
	After-application	48	96	1	2	1	2	2	4	20	40	28	56	45.89	0.001**
Drinking 8 to 10 glasses of water daily.	Before-application	6	12	30	60	14	28	5	10	30	60	15	30	0.12	0.729ns
	After-application	48	96	1	2	1	2	3	7	35	70	12	24	37.44	0.001**
Participating in regular physical activity, ex. (Walking).	Before-application	2	4	3	6	45	90	8	16	2	4	40	80	4.38	0.03*
	After-application	47	94	2	4	1	2	2	4	2	4	46	92	46.09	0.001**
Compliance with prescribed medications.	Before-application	3	6	25	50	22	44	2	4	18	36	30	60	3.20	0.074ns
	After-application	48	96	1	2	1	2	3	7	15	30	32	64	46.78	0.001**
Taking rest (the left side) and adequate sleep.	Before-application	3	6	7	14	40	80	4	8	20	40	26	58	5.29	0.02*
	After-application	47	94	2	4	1	2	2	4	20	40	28	56	41.33	0.001**
Managing and coping with stress.	Before-application	2	4	18	36	30	60	2	4	18	36	30	60	0.00	1.00ns
	After-application	40	80	8	16	2	4	3	7	15	30	32	64	44.78	0.001**
Counting fetal kicks daily.	Before-application	3	6	25	50	22	44	4	8	20	40	26	58	2.04	0.153ns
	After-application	48	96	1	2	1	2	2	4	20	40	28	56	44.56	0.001**
Compliance with recommended antenatal visits.	Before-application	2	4	3	6	45	90	5	10	30	60	15	30	8.40	0.004**
	After-application	47	94	2	4	1	2	3	7	35	70	12	24	50.12	0.001**
Take prescribed supplements as recommended by healthcare provider	Before-application	3	6	25	50	22	44	8	16	2	4	40	80	8.91	0.003**
	After-application	48	96	1	2	1	2	2	4	2	4	46	92	42.67	0.001**

χ^2 = Chi-square test. P-value: Level of significance. **P < 0.01 Highly significance (HS)

Table (6): Before implementation of CCM, the pre-eclamptic women in both groups demonstrated inadequate self-care practices related to pre-eclampsia, with most of them reporting that they “sometimes” or “never” performed. Following the implementation, almost all the pre-eclamptic women in the study group reported “always” performing every self-care activity, while slightly improvement was detected in the control group. The difference between the study and control groups after the application was highly statistically significant ($p < 0.001$).

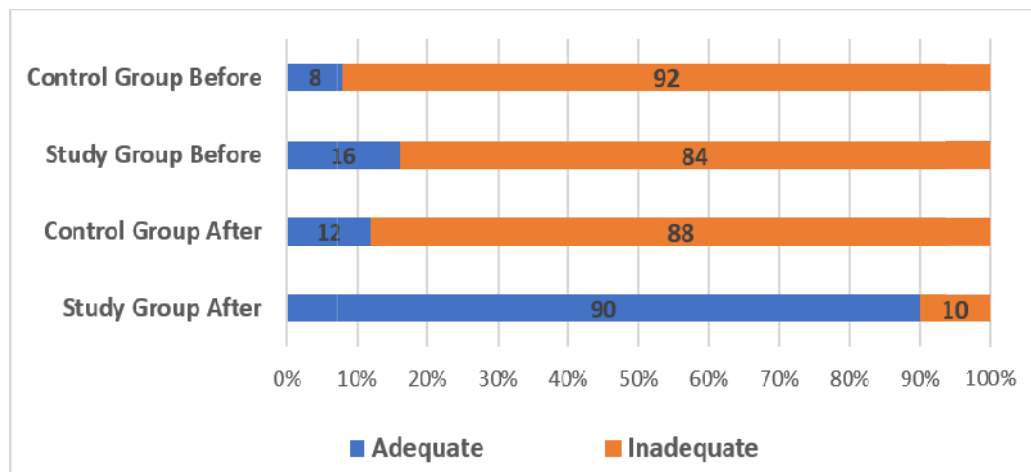


Figure 2: Comparison Between Self- Care Reported Practices Levels of the pre-eclamptic women Between Study and Control Groups before and after the application of the continuous care model (n=100).

Figure (2): illustrates a marked improvement in the study group's practices adequate level increasing from 16% pre-implementation to 90% following the implementation of the CCM. In contrast, the control group's practices remained relatively stable, showing only a slight change from 8% pre- implementation to 12% post- implementation. The statistical analysis revealed a highly statistically significant difference between the two groups post-application ($\chi^2 = 145.16$, $p < 0.001$).

Table (7): Mean and standard deviation of total quality of life (WHOQOL-BREF) domains scores among the pre-eclamptic women before and after the application of continuous care model.

Domains		Study group (n=50)	Control group (n=50)	Independent t-test	p-value
		Mean $\pm$ SD	Mean $\pm$ SD		
Physical health	Before-application	28.0 $\pm$ 6.5	27.5 $\pm$ 5.9	0.37	0.711 (ns)
	After-application	95.0 $\pm$ 4.2	29.0 $\pm$ 6.3	49.62	<0.001**
Psychological	Before-application	31.2 $\pm$ 7.1	30.8 $\pm$ 6.9	0.28	0.781 (ns)
	After-application	92.4 $\pm$ 5.0	32.1 $\pm$ 6.5	44.37	<0.001**
Social relationships	Before-application	34.2 $\pm$ 5.8	33.6 $\pm$ 6.0	0.42	0.67(ns)
	After-application	88.5 $\pm$ 4.6	35.1 $\pm$ 5.9	28.93	< 0.001**
Environment	Before-application	40.2 $\pm$ 6.0	41.0 $\pm$ 6.1	0.64	0.52 (ns)
	After-application	88.1 $\pm$ 3.9	42.4 $\pm$ 6.0	26.37	< 0.001**
Overall Quality of Life& General Health	Before-application	33.9 $\pm$ 5.6	34.1 $\pm$ 5.8	0.18	0.86 ns
	After-application	89.2 $\pm$ 4.4	35.0 $\pm$ 5.9	31.46	< 0.001**

T= independent t-test, P-value: Level of significance, ns = Non-significant $P > 0.05$, * $P < 0.05$
Significance (S) **P Highly significance (HS) < 0.0

Table (7) Before the implementation, no statistically significant differences were observed between both groups in any QOL domain ($p > 0.05$), indicating their homogeneity at baseline. However, following the implementation, the study group showed a highly significant improvement ($p < 0.001$) across all domains—physical, psychological, social, environmental, and overall QOL—compared to the control group.

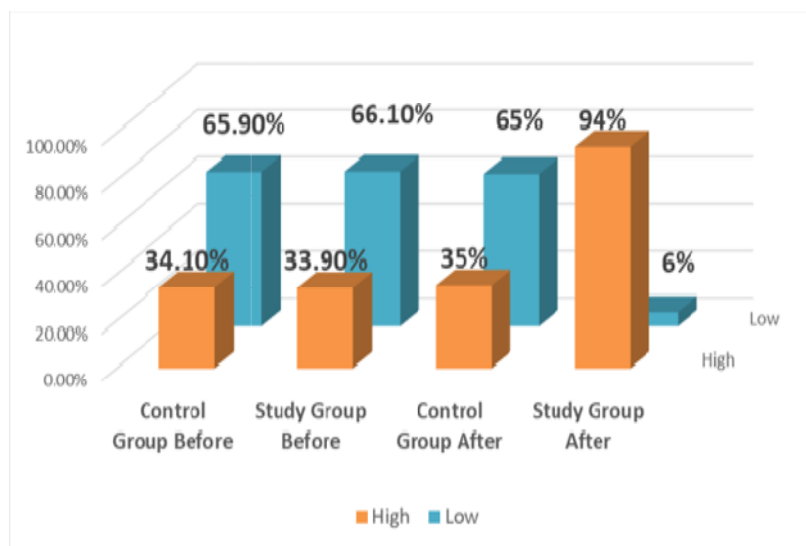


Figure (3): Comparison Between Study and Control Groups Regarding Total Quality of Life (WHOQOL-BREF). Preeclamptic women's before and after the application of the continuous care model (n=100).

Figure (3): illustrates a manifest improvement in the study group's QOL level increasing from 33% pre-implementation to 94% following the implementation of the CCM. In contrast, the control group's practices remained relatively stable, showing only a slight change from 34% pre-implementation to 35% post-implementation. The difference between groups post-implementation was highly statistically significant ($t = 31.46$, $p < 0.001$).

Table 8: Relation between socio-demographic characteristics of the pre-eclamptic women and their self-care reported practice after application of continuous care model (n=50).

Variables	Self-care reported practice of the pre-eclamptic women (n=50)				χ^2 test	p-value
	Competent (n=45)		Incompetent (n=5)			
	N	%	N	%		
Marital status						
Married					31.55	0.001**HS
Divorced	41	91.1	2	40		
Widow	4	8.9	0	0		
	0	0	3	60		

Educational level						
Primary Education	1	2.2	0	0	8.57	
Preparatory Education	10	22.2	0	0		
Secondary Education	28	62.2	2	40		
Highly educated	6	13.3	3	60		
						0.03*S
Income adequacy						
Enough	1	2.2	1	20	6.62	
Not Enough	44	97.8	4	80		
						0.03*S

χ^2 = Chi-square test. P-value: Level of significance. *P < 0.05 Significance (S) **P < 0.01 Highly significance (HS)

Table (8) shows that there was a highly statistically significant relationship between marital status and self-care reported practices ($p < 0.001$), while a statistically significant relationship was found between educational level and self-care practices, as well as between income adequacy and self-care practices ($p < 0.05$ for both).

Table 9: relation between socio-demographic characteristics of the pre-eclamptic women and their total quality of life after application of the continuous care model (n=50).

Variables	Quality of Life of the pre-eclamptic women (n=50)				χ^2 test	p-value
	High (n=47)		Low (n=3)			
	N	%	N	%		
Age (years)						
18 – 23	25	53.2	1	33.3	6.41	0.04*S
24 – 29	16	34	0	0		
≥ 30	6	12.8	2	66.7		

χ^2 = Chi-square test. P-value: Level of significance. *P < 0.05 Significance (S)

Table (9) shows the relationship between socio-demographic characteristics and QOL among the pre-eclamptic women. The Chi-square test revealed that age ($p = 0.04$) was statistically significantly associated with QOL.

Table (10): Correlation between total knowledge, total self-practice, and total quality of life among preeclamptic the pre-eclamptic women after application of continuous care model (n=50).

Variables		Total Knowledge		Total self-care reported Practice		Total quality of life	
		R	P	R	p	R	P
Total Knowledge	Control group	1.00	---	0.15	0.31	0.12	0.41
	Study group	1.00	---	0.85	< 0.001**	0.78	< 0.001**
Total self-care reported Practice	Control group	0.15	0.31	1.00	---	0.18	0.22
	Study group	0.85	< 0.001**	1.00	---	0.82	< 0.001**
Total quality of life	Control group	0.12	0.41	0.18	0.22	1.00	---
	Study group	0.78	< 0.001**	0.82	< 0.001**	1.00	---

*Significant $p \leq 0.05$ **Highly significant $p \leq 0.001$ *Small effect size ($0.20 < 0.50$) **Medium effect size ($0.50 < 0.80$) ***Large effect size ($0.50 \geq 0.80$)

Table (10) reveals a strong correlation between the study and control groups after implementation of the CCM. In the control group, there was non-significant correlations were observed among knowledge, self-care practices, and QOL ($r = 0.12$ to 0.18 , $p > 0.05$). Conversely, the study group demonstrated highly significant positive correlations: knowledge was strongly linked to self-care practices ($r = 0.85$, $p < 0.001$), self-care practices were strongly associated with QOL ($r = 0.82$, $p < 0.001$), and knowledge was also strongly correlated with QOL ($r = 0.78$, $p < 0.001$).

Discussion:-

Preeclampsia remains a major contributor to maternal and perinatal morbidity and mortality worldwide, underscoring the importance of effective educational and supportive interventions that empower women to actively participate in disease management. The Continuous Care Model (CCM) emphasizes continuous education, regular follow-up, and individualized counselling, all of which are intended to strengthen self-care behaviours and improve health-related quality of life among women with preeclampsia (Nuampa et al., 2026). Accordingly, the present study evaluated the effectiveness of the CCM in improving women's self-care practices and quality of life. The findings provide additional evidence supporting the integration of structured, nurse-led continuous care into routine antenatal services, particularly for women with high-risk pregnancies who require ongoing monitoring and reinforcement of self-management behaviours.

The comparable sociodemographic and obstetric characteristics of the study and control groups indicate successful baseline equivalence, thereby reducing the likelihood that baseline differences influenced the study outcomes. Similar baseline characteristics strengthen the internal validity of the study by increasing confidence that post-intervention differences were more likely to be associated with the intervention rather than participant characteristics. The predominance of young women with secondary education, limited income, rural residence, and a high proportion of housewives is consistent with previous studies conducted in comparable populations (Garbo et al., 2025; Wang et al., 2025). These characteristics also reflect common socioeconomic challenges faced by women with preeclampsia in low- and middle-income countries, where limited health literacy, financial constraints, and reduced access to healthcare resources may hinder effective disease management. Previous evidence has similarly demonstrated that social determinants of health influence women's ability to engage in recommended self-care practices and access timely antenatal care.

Similarly, the absence of significant differences in baseline clinical characteristics, including blood pressure, body mass index, and dietary habits, further supports the comparability of the two groups before implementation of the intervention. The high prevalence of overweight women observed in the present study is consistent with substantial evidence identifying increased body mass index as an important modifiable risk factor for hypertensive disorders of pregnancy (WHO, 2025; Zhang et al., 2025). Excess adiposity contributes to endothelial dysfunction, chronic inflammation, and metabolic disturbances that increase susceptibility to preeclampsia. Although some studies have suggested that this association may be influenced by maternal age, parity, and underlying metabolic status (Horner et al., 2025), maintaining a healthy body weight remains an important component of preeclampsia prevention and management. Likewise, the similarity in baseline dietary patterns indicates that nutritional behaviours were unlikely to confound the intervention effect and highlights the importance of incorporating individualized nutritional counselling into continuous care programmes. Collectively, these findings enhance the internal validity of the study and provide a robust foundation for evaluating the effects of the Continuous Care Model.

The present findings suggest that the Continuous Care Model was associated with substantial improvements in **women's knowledge** regarding preeclampsia compared with routine antenatal care. Especially, before implementation of the CCM for both groups approximately more than third quarter unsatisfactory level of the total knowledge score, and after implementation the control group demonstrated no significant improvement in knowledge, whereas the vast majority (ninety-four percentages) of the preeclamptic women in the study group achieved a satisfactory level of knowledge. This improvement may be explained by the structured nature of the intervention, which combined individualized education, continuous follow-up, repeated reinforcement, and an illustrated educational booklet. Together, these components are likely to have enhanced participants' understanding of preeclampsia, facilitated retention of health information, and encouraged active engagement in disease management. The educational booklet may also have served as a readily accessible reference, allowing

participants to review the information when needed and reinforcing learning beyond the educational sessions. However, it is also possible that repeated contact with healthcare providers, increased attention during follow-up, and participants' motivation to learn contributed to the observed improvements.

These findings are consistent with previous studies demonstrating that structured educational interventions improve knowledge among women with preeclampsia. Alhassan et al. (2025) similarly reported significant improvements in women's knowledge following a nursing educational intervention. Likewise, Lee et al. (2025) observed that although educational interventions initially improved knowledge, continuous reinforcement was necessary to sustain knowledge retention over time. This supports the theoretical basis of the Continuous Care Model, which emphasizes ongoing interaction between healthcare providers and patients rather than one-time education. Furthermore, evidence from systematic reviews of educational and self-management interventions in high-risk pregnancy has shown that continuous education and follow-up are associated with improved maternal knowledge, adherence to recommended health behaviours, and patient engagement, supporting the potential value of incorporating the Continuous Care Model into routine antenatal care. Thus, the first hypothesis was achieved through the current study result.

The CCM aims to strengthen **self-care practices**, enhance adherence to treatment recommendations, and promote the early recognition of warning signs, thereby increasing women's confidence and active participation in managing their condition. The present findings suggest that implementation of the Continuous Care Model was associated with improved self-care practices among women with preeclampsia compared with routine antenatal care. Especially, before the implementation of the CCM more than three-quarters of the preeclamptic women in both groups demonstrated an incompetent level of overall self-care practices, but after implementation more than four of fifth pregnant women in the study group has the adequate level of self-care reported practices and the control group slightly changed. This improvement may be explained by the model's emphasis on continuous education, individualized counselling, regular follow-up, and reinforcement of recommended self-care behaviours. These components are likely to enhance women's self-efficacy, increase their confidence in managing the condition, and promote adherence to recommended lifestyle modifications, medication regimens, blood pressure monitoring, and timely recognition of warning signs. The regular follow-up sessions and telephone contacts may also have reinforced behavioural changes by providing ongoing support, addressing participants' concerns, and encouraging sustained engagement in self-management. However, repeated contact with healthcare providers, increased participant motivation, and family support may also have contributed to the observed improvements and should be considered when interpreting the findings.

The present findings are consistent with previous studies demonstrating the beneficial effects of structured educational and supportive interventions on self-care behaviours among women with preeclampsia. Moustfa et al. (2024) similarly reported significant improvements in lifestyle modification and self-care practices following implementation of the Continuous Care Model. Likewise, Rahman et al. (2025) found that women who received continuous educational support and regular follow-up demonstrated greater adherence to self-care recommendations and earlier recognition of preeclampsia warning signs. Conversely, Lee et al. (2025) observed that although educational interventions improved self-care initially, these improvements declined when continuous reinforcement and follow-up were not maintained. This finding further supports the theoretical foundation of the Continuous Care Model, which emphasizes sustained interaction between healthcare providers and patients as a key mechanism for promoting long-term behavioural change. Furthermore, evidence from systematic reviews has shown that continuous educational and behavioural support enhances self-management, treatment adherence, and patient engagement among individuals with chronic conditions, reinforcing the potential value of integrating the Continuous Care Model into routine maternity care. Thus, the second hypothesis was achieved through the current study result.

Preeclampsia has a profound negative impact on women's **health-related quality of life** because of its physical symptoms, the need for frequent medical surveillance, uncertainty regarding pregnancy outcomes, and concerns about maternal and fetal well-being. Consequently, interventions that combine education with continuous support are essential to address both the clinical and psychosocial challenges associated with the condition (WHO, 2025). In the present study, women in both the intervention and control groups had low mean quality-of-life scores across all domains before implementation of the Continuous Care Model (CCM), reflecting the considerable physical, psychological, and social burden associated with preeclampsia. Following the intervention, the study group demonstrated a significant improvement in quality-of-life scores, with (ninty four percent) of women achieving a high overall quality of life, whereas the control group showed only minimal

improvement compared with baseline. These findings suggest that the CCM was associated with improved quality of life among women with preeclampsia. This improvement may be explained by the model's emphasis on continuous education, individualized counselling, regular follow-up, and active patient participation, which are likely to enhance women's understanding of their condition, strengthen self-efficacy, reduce uncertainty, and promote adherence to recommended self-care practices. Improved symptom management and greater confidence in managing pregnancy-related complications may also have contributed to better physical, psychological, and social well-being. However, the observed improvements may also have been influenced by repeated contact with healthcare providers, increased participant motivation, family support, and other contextual factors; therefore, the findings should not be attributed solely to the intervention.

The present findings are consistent with previous evidence demonstrating that preeclampsia adversely affects women's quality of life and that structured educational and supportive interventions may improve patient-reported outcomes. Molla et al. (2024) concluded that preeclampsia has substantial physical and psychological consequences that negatively affect women's quality of life. Similarly, Xing et al. (2025) reported that better self-management capacity and adherence to healthy behaviours were associated with improved psychological well-being and quality of life among women at high risk of preeclampsia. Conversely, Lee et al. (2025) found that improvements in knowledge alone were insufficient to sustain long-term quality-of-life gains without ongoing support, whereas Duarte et al. (2024) highlighted the continuing influence of socioeconomic hardship, psychological distress, and limited family support on women's quality of life despite improvements in self-care. Collectively, these findings suggest that although the Continuous Care Model may enhance quality of life by improving women's knowledge, self-management, and engagement in care, broader psychosocial and socioeconomic determinants should also be addressed to achieve sustained improvements. Thus, the third hypothesis was achieved through the current study result.

The present study demonstrated that selected sociodemographic characteristics were significantly associated with self-care practices among women with preeclampsia. Married women exhibited better self-care practices than unmarried women, suggesting that social and family support may play an important role in facilitating adherence to recommended health behaviours. Spousal support may enhance women's confidence in managing their condition, encourage attendance at scheduled antenatal visits, improve adherence to prescribed medications, and promote timely recognition of warning signs requiring medical attention. These findings are consistent with behavioural theories, which propose that supportive interpersonal relationships positively influence self-efficacy, health-related decision-making, and long-term adherence to self-management behaviours.

Educational attainment and adequate household income were also associated with better self-care practices. Women with higher educational levels may be better able to understand health information, evaluate health risks, and apply recommended preventive measures, whereas adequate financial resources facilitate access to healthcare services, transportation, medications, nutritious food, and self-monitoring resources. These factors collectively reduce barriers to adherence and support more effective disease management. Nevertheless, the influence of education and income should be interpreted cautiously, as these factors may act indirectly through health literacy, access to healthcare, and social support rather than exerting independent effects on self-care behaviours.

The present findings are consistent with previous evidence demonstrating that social support, educational attainment, and socioeconomic resources positively influence healthcare-seeking behaviours and self-management among women with high-risk pregnancies (Muhindo et al., 2025; Alsabi et al., 2025; Elshabory et al., 2025). Muhindo et al. (2025) reported that family encouragement and financial capability facilitated timely healthcare seeking and adherence to follow-up recommendations, while Alsabi et al. (2025) demonstrated that women with higher educational attainment achieved better knowledge acquisition and self-care following educational interventions. However, conflicting evidence suggests that sociodemographic characteristics alone do not fully explain variations in self-care behaviours. Mohamed et al. (2025) found no significant association between marital status and women's awareness regarding preeclampsia, whereas Hussien et al. (2025) and Kolcu et al. (2025) reported that health literacy, self-efficacy, and structured educational interventions were stronger predictors of self-care than educational level or income alone. These findings indicate that although favourable sociodemographic characteristics may facilitate self-management, they are neither necessary nor sufficient to ensure optimal behavioural outcomes.

Taken together, the present findings suggest that the benefits of the Continuous Care Model extend beyond the provision of health information. By combining individualized education, continuous follow-up, behavioural reinforcement, and ongoing professional support, the model may reduce disparities associated with educational and socioeconomic differences and strengthen women's capacity to engage in effective self-management. Nevertheless, because the present study employed a quasi-experimental design, these associations should be interpreted cautiously, and future randomized controlled trials are warranted to determine whether the Continuous Care Model can consistently mitigate the influence of sociodemographic disparities on self-care behaviours among women with preeclampsia.

The present study demonstrated a significant association between maternal age and quality of life among women with preeclampsia. This relationship may reflect age-related differences in women's physical, psychological, and social adaptation to pregnancy complications. Younger women may have limited experience in recognising and managing pregnancy-related health problems, whereas women of advanced maternal age often experience a greater burden of obstetric comorbidities, increased pregnancy-related anxiety, and concerns regarding maternal and fetal outcomes. Together, these factors may adversely affect physical functioning, emotional well-being, and overall quality of life.

The present findings are consistent with previous studies demonstrating that maternal age is an important determinant of quality of life among women with preeclampsia. Setyawati et al. (2025) similarly reported a significant association between maternal age and quality of life, while Bukhari et al. (2025) observed that advanced maternal age was associated with poorer maternal and neonatal outcomes. However, not all studies have reached the same conclusion. Barrientos Gómez et al. (2024) suggested that disease severity and prolonged hospitalization exert a greater influence on quality of life than maternal age alone, whereas Nandagopal et al. (2025) emphasized that clinical and obstetric characteristics may be stronger predictors of maternal outcomes than chronological age. Collectively, these findings indicate that maternal age should be considered alongside disease severity, obstetric risk factors, and psychosocial circumstances when evaluating quality of life among women with preeclampsia.

Another important finding of the present study was the significant positive correlation between knowledge, self-care practices, and quality of life before and after implementation of the Continuous Care Model. This relationship suggests that women who possess greater knowledge about preeclampsia are more likely to engage in appropriate self-care behaviours, which may improve symptom control, reduce uncertainty, enhance self-efficacy, and ultimately contribute to better health-related quality of life. These findings are consistent with behavioural theories, which propose that knowledge is an essential prerequisite for informed decision-making and sustained health behaviour change. Nevertheless, knowledge alone is unlikely to produce lasting improvements unless accompanied by continuous reinforcement, professional support, and opportunities to apply learned behaviours in daily practice.

The present findings are supported by Dlamini et al. (2025), who demonstrated that greater maternal knowledge and engagement in self-care were associated with better physical well-being, emotional stability, and overall quality of life among women with hypertensive disorders of pregnancy. Similarly, Karimi et al. (2025) reported that increased maternal awareness was positively associated with healthier self-care behaviours and improved maternal health outcomes. In contrast, Munyungula and Shakwane (2025) found that although women expressed positive attitudes towards self-management, limited knowledge often prevented effective implementation of recommended self-care practices. These findings suggest that improving knowledge is necessary but may not be sufficient to achieve optimal quality of life unless educational interventions are reinforced through continuous follow-up, individualized counselling, and sustained professional support. This may explain why women who participated in the Continuous Care Model experienced greater improvements in both self-care practices and quality of life than those who received routine antenatal care alone.

Limitation of the Study: -

The quasi-experimental design without random allocation limits causal inference and may have introduced selection bias. As the study was conducted at a single tertiary hospital in Egypt, the findings may not be generalizable to other settings.

Conclusion:-

Based on the results of the current study, it can be concluded that implementing the continuous care model had a positive effect on exhibit satisfactory level of the total score knowledge, adequate self-care practices and demonstrate high total score of the quality of life regarding preeclampsia management. Hence, the study aim was achieved, and the research hypothesis was supported.

Recommendations:-

The following recommendations are suggested, considering the findings of the study:

Recommendations for clinical and nursing practices:-

1. Integrate the Continuous Care Model into routine nursing care for women with preeclampsia to improve knowledge, self-care practices, and health-related quality of life.
2. Provide structured educational programmes and regular follow-up for women with preeclampsia to reinforce self-care behaviours and promote early recognition of disease-related warning signs.
3. Encourage active participation of women and their families in the management of preeclampsia to enhance adherence to recommended care and improve maternal outcomes.

Recommendations for healthcare organizations:-

1. Support the implementation of standardized Continuous Care Model programmes within antenatal care services for women with preeclampsia.
2. Provide regular training for maternity healthcare professionals on the principles and implementation of the Continuous Care Model and patient-centred education.

Recommendations for health policy and clinical Practice guidelines:-

1. Consider incorporating evidence-based continuous care approaches into national clinical practice guidelines for the management of women with preeclampsia.

Recommendations for further research:-

1. Conduct multicentre randomized controlled trials with larger sample sizes to confirm the effectiveness of the Continuous Care Model among women with preeclampsia.
2. Evaluate the long-term sustainability of improvements in knowledge, self-care practices, and quality of life following implementation of the Continuous Care Model.
3. Examine the effectiveness of the Continuous Care Model in different healthcare settings and among diverse populations of women with hypertensive disorders of pregnancy.

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