Investigate Healthy and Unhealthy Behaviors among Preeclamptic Women

Asmaa Yehia Khairy (1), Kamelia Ragab Abou Shabana (2), Amal Fathy Mohamed (3), Heba Mahamoud Mohamed (4)

(1) Master student at faculty of nursing, Ain- shams University.(2) Assistant Professor of Obstetrics and Gynecological Nursing faculty of nursing, Ain- shams University(3) Assistant professor of Obstetrics and Gynecological Nursing faculty of nursing, Ain- shams University(4) Professor of Obstetrics and Gynecological Nursing faculty of nursing, Ain- shams University

Abstract

Background: the current study aimed to investigate healthy and unhealthy behavior among pre-eclamptic women. **Design** A descriptive study design was used in the current study. **Setting**: The study was conducted at the Ain Shams University Maternity Hospital's Antenatal Clinic. **Sample:** A purposive sample of 186 pregnant women was enrolled in the study. **Tools:** two tools were used for data collection; **I)** A structured interviewing questionnaire, and **II)** A Healthy and Unhealthy behavior Scale. **Results:** 66.77% of the study subjects had incorrect total knowledge regarding preeclampsia and 33.3% of them had correct total knowledge regarding preeclampsia. Also, 53.8% of the studied women had unhealthy behavior while 46.2% of the studied women had healthy behavior. Additionally, there was a highly significant positive correlation between the total knowledge of the studied women about pre-eclampsia and their total healthy behavior at (P= < 0.01). **Conclusion**: More than two-thirds of the study subjects had incorrect total knowledge about pre-eclampsia and one-third of them had correct total knowledge about pre-eclampsia. Additionally, the present study results depicted that more than half of the studied women had unhealthy behavior and less than half of them had healthy behavior. **Recommendations:** Outreach and rising awareness programs related to knowledge, self-care measures, and health behaviors must be designed and implemented to correct unhealthy behaviors and promote healthy ones among preeclamptic women at outpatient clinic.

Keywords: Healthy, Unhealthy, Behavior, Preeclampsia

Introduction

Pregnancy is a stressful period with various physiological, psychological, biochemical, and anatomical changes in the body. These physiological changes sometimes cause pathological conditions and diseases for the pregnant women. Evidence is emerging that pre-eclampsia (PE) is the greatest common hypertensive disorder of pregnancy and the most serious complications in obstetrics **(Rubenovna et al, 2021).**

Preeclampsia is a multisystem progressive disorder characterized by the new onset of hypertension "systolic blood pressure 140 mm Hg and diastolic blood pressure 90 mm Hg" and presence of proteinuria or the new onset of hypertension plus significant end-organ dysfunction with or without proteinuria in a previously normotensive patient and with or without pathogenic edema at 20-24 weeks of gestation and 4-6 weeks postpartum. Proteinuria is defined as 300 mg of protein in 24 hours or there is protein/creatinine in urine this ratio of 0.3 mg/dL. Urine dipstick can only be used if the other methods are not available (**August & Sibai., (2023).**

Also, women with preeclampsia may eventually develop symptoms including changes in vision, like blurriness, flashing lights, seeing spots or being sensitive to light, new-onset headache (frontal and throbbing) that doesn't go away with analgesics, nausea, vomiting or dizziness, new-onset constant epigastric pain or right upper quadrant abdominal, anorexia, nausea, vomiting, sudden weight gain (2 to 5 pounds in a week), swelling in the legs, hands or face caused by fluid retention and trouble breathing **(Mitchell-Brown et al., (2020).**

Moreover, the main cause of preeclampsia is complex and unknown but there are several risk factors for its development

which including maternal age (under 18 years old or over 35 years old), maternal race, ethnicity, education, socioeconomic status, pre-pregnancy BMI, parity, multiple gestations, family history of preeclampsia, prior history of preeclampsia, obesity, genetic factors, diet, preexisting medical conditions such as chronic hypertension, pre-existing diabetes, and gestational diabetes mellitus were evaluated as determinants for PE and its subtypes (**Lin et al., (2021).**

Preeclampsia can affect the mother and fetus causing catastrophic problems including maternal as eclampsia, placental abruption, postpartum hemorrhage, preterm delivery, increased cesarean section rates, increased risk of cardiovascular diseases, venous thromboembolism, and maternal mortality. Also, it can negatively affect pregnancy outcomes as intrauterine growth retardation, prematurity, asphyxia at birth, fetal distress during pregnancy and after delivery and neonate intensive care unit admission **(El Sayed et al., (2020)**

Medical Management of preeclampsia based on signs and symptoms and/or laboratory deterioration, stratification of gestational age and guidance on route of delivery. At the gestational age > 24 weeks, expectant management is maintaining adequate blood pressure control by medical intervention and some changes in living behaviors, watch for signs and symptoms of eclampsia, maintain laboratory monitoring and monitoring of the well-being and growth of the fetus. At the gestational age > 37 Weeks, the management is as above and also postpone delivery to the nearest term **(Peraçoli et al., (2019)**

Pregnancy represents a time when many women are motivated to make health behavior changes and may be exposed to additional health information and services. Poor healthy living behaviors would increase the risk of pregnant women getting preeclampsia while healthy living behavior including nutritional status, hygiene, sanitation, awareness of healthy living and the reach and quality of health services prevents the occurrence of preeclampsia. Therefore, to reduce the risk of preeclampsia in pregnant women action is needed including early prevention and management by having good healthy living behaviors **(Iqomatulhaq & Solehati, (2019)**.

The nurse has multidisciplinary roles in the care of preeclamptic women including care provider, manager, educator, coordinator, and researcher. Nursing care in managing pre-eclampsia can be called a holistic service, where nurses as health workers pay attention to biological, psychological, social, and spiritual status of patients **(Puspitasari et al., (2020)**

Nurses play a vital role in providing safety practices in the prevention and changing the lifestyle and unhealthy behavior by educating women with pre-eclampsia on how to prevent its occurrence. **(Abdallah Sayed et al., (2020).** Moreover, nurses provide anticipatory guidance, improve a supportive-educational system, teach patients coping strategies for stress management, implement full scientific evidence-based research, surveys on advances and updates about preeclampsia. and promote the precise referral timing **(Puspitasari et al., (2020).**

Significance of the study

Pre- eclampsia is one of the leading causes of maternal and perinatal morbidity and mortality. Globally, 76 000 maternal deaths and 500,000 infant deaths each year from this disorder **(Poon et al., (2021).** Preeclamptic incidents are on the rise worldwide, and the condition's prevalence is greater in developing countries as compared to the developed world. About 1.8-16.7% of the incidents are reported in developing countries, while in developed countries, the rate is 0.4%. According to the World Health Organization (WHO), the incidence of preeclampsia ranges between 2% and 10% of pregnancies worldwide **(Khan et al.,2022).**

The prevalence of preeclampsia in Egypt is approximately 6% - 8% of all pregnancies and can be as high as 15% in referral centers such as university hospitals (**Ameen et al., (2023).**

Nowadays, the attitude of providing healthcare services has changed from the treating of diseases to preventing and promoting health. As a result, the adoption of health-related behaviors has been recognized as a powerful element to minimize the occurrence of adverse maternal and perinatal outcomes, prevent the progress of chronic diseases, increasing the control of individuals on health status and weight maintenance, consequently, improve woman and neonate's health (**Surita et al.,**

(2020).

Aim of the study

The aim of the study was to investigate healthy and unhealthy behavior among pre-eclamptic women.

Research questions:

1.What are the women knowledge regarding preeclampsia?

2.What are the healthy and unhealthy behaviour among preeclamptic women?

3.What are the reasons of preeclamptic women to attend health service?

4.What are the barriers for preeclamptic women to seek health service?

5.What are the relation between preeclamptic women knowledge, healthy & unhealthy behaviour and the barriers to seek health?

Subjects and Methods

Research design:

A descriptive study design was used to achieve the aim of the current study.

Setting:

The study was conducted at outpatient clinics at the Ain Shams University Maternity Hospital. It is an educational hospital that serves a very large number of citizens. The previous place provides a wide range of services such as antenatal care, family planning, gynecological examination, breastfeeding support, and screening services.

The hospital offers other services such as an early detection unit, a delivery unit, an intensive care unit, gynecological operations, post-operative care, and inpatient units.

Subjects:

Sample type:

A Purposive sample was used for this study with the following:-

Inclusion criteria:

- Medically Diagnosed with preeclampsia
- Without any medical complications
- Age (18 to 35 year)

Sample size: The current study was conducted on 186 pregnant women.

Sample size Equation:

The researcher depended on the following equation to calculate the sample size: **(Krejcie and Morgan, 1970)**

$$\mathbf{n} = \frac{N \times p(1-p)}{\{N-1 \times (d^2 \div z^2) + p(1-p)\}}$$

$$\mathbf{186} = \frac{360 \times 0.50(1-0.50)}{\{360-1 \times (0.05^2 \div 1.96^2) + 0.50(1-0.50)\}}$$

n= Sample size

N = Community size

z = Class standard corresponding to the level of significance equal to 0.95 and 1.96

d = The error rate is equal to 0.05

p = Ratio provides a neutral property = 0.50

Tools of Data collection

Two data collection tools were used to carry out the current study namely, structured interviewing questionnaire, and risk factors assessment tool.

1. Structured Interviewing Questionnaire

It was developed by a researcher after reviewing the recent and relevant literature. It was divided into four parts and consisted of 52 multiple choices and closed ended questions as the following:.-

Part I

It was designed to assess general characteristics of the study sample as (age, educational level, occupation, residence) (Questions 1-4)

Part II

It was planned to assess previous and current obstetric history.

- Previous obstetric history as (gravidity, parity, abortion, previous pregnancy complications, previous labor complications, previous postpartum complications, type of previous delivery, previous pregnancy outcomes, and follow up during a previous pregnancy) (Questions 5-15).
- Current pregnancy history includes (Gestational Age, the reason for visit during current pregnancy, Number of ANC visits) (Questions 16-18).

Part III

It was aimed to assess women's knowledge regarding preeclampsia including (definition, risk factors, signs and symptoms, complications of preeclampsia for mother, complications of preeclampsia for fetus, the food must be avoided, the pre -eclampsia prevention methods, the appropriate place for pre-eclampsia births, and the source of your information) (Questions 18-26).

- **Knowledge Scoring system**

Each question scored as **(2)** for **correct** answer and **(1)** for **Incorrect** answer:

- Correct knowledge (≥ 60%)

- Incorrect knowlege (< 60%)

Part IV

It was designed to assess barriers that preventing preeclamptic women to comply with health behavior. It includes five parts namely economic reasons (3 items) from (Questions 27-29), social reasons (5 items) from (Questions 30-34), psychological reasons (5 items) from (Questions 35-39), health services related reasons (10 items) from (Questions 40-49), and religious and cultural reasons (3 items) from (Questions 50-52).

I)A Healthy and Unhealthy behavior Scale.

It was adopted from the Health Promoting Lifestyle Profile II **(Walker et al., 1995)** & **(Iqomatulhaq & Solehati et al (2019).** and modified by the researcher after reviewing the national and international relevant literature related to the study. It consists of (46 statement) with 6 domains measured, namely physical activity (7 statement) as (participating in regular physical activity, avoid hard and heavy home activities.), nutrition (8 statement) as (consuming the recommended preeclampsia diet, Drinking 8 to 10 glasses of water daily.), moral development (7 statement) as (feel I am growing and changing in positive ways during pregnancy.), interpersonal communications (6 statement) as (spend my spare time with my friends and family.), stress management (7 statement) as (self-coping and healthy adaptation with stress and tension.), Health Duties (11 statement) as (watch TV health programs and attend educational programs to improve my health behavior,.) to measure healthy and unhealthy behavior among preeclamptic women.

- **Scoring system for health behavior**

The items were rated based on a three-point Likert scale; **3** for (**Always)**, **2** for (**Sometimes),** and **1** for (**Never).**

So, the total score of health behaviors is classified as the following:

- Health behavior (≥80%)
- Unhealth behavior (<80%)

The lower the score, the lower the health behaviors and the higher the score, health behaviors are at a more favorable level.

Validity and Reliability

Validity:

The face and content validity of the study tools was assessed by a jury consisted of three experts in obstetric and gynecological nursing department of faculty of nursing, Ain Shams University for comprehensiveness, accuracy and clarity in language according to their opinion some modifications were considered.

Reliability:-

Study tools were tested for its internal consistency by using Cronbach's alpha coefficient. It was 0.808 for structured interviewing questionnaire and 0.843 for a healthy and unhealthy behavior Scale.

Pilot study

The pilot study carried out a sample of preeclamptic women representing about 10 % of total sample (18 pregnant woman) for one month during the period from 9th May 2022 to 10th June 2022. The aim was to test the clarity, simplicity, relevancy and evaluate applicability of the study and validity of the tools. There was not modification in the results of the pilot study. So, the pilot study sample number included from sample size.

Administrative Design:

An official approval was obtained from Dean of faculty of nursing Ain Shams University and an official letter containing title and aim of study was directed to the director of Ain Shams university Maternity hospital to get their consent for conducting the study at the previous selected setting.

Ethical Considerations:-

Ethical approval was obtained from Obstetrics and Gynecological Nursing Department, Scientific Research Ethical committee in Faculty of Nursing at Ain Shams University and the director of Ain Shams Hospital before starting the study. Written informed consent was obtained from each woman after giving a detailed description of the study. Each woman was informed that participating in the study is completely voluntary, and they have the right to withdraw at any time. Human rights were considered and respected. All data gathered was kept strictly confidential and used only for research purposes.

Preparatory phase

This phase was started with a review of current, past, national, and international related to the study topics using textbooks,

journals, scientific magazines, articles, and websites that was helped the researcher in reviewing and developing the data collecting tools. The developed tool was examined for validity and reliability by a jury expert to test the content, knowledge, accuracy, and relevance of questions for tools. Researcher made any needed modification on tools of data collection after their revising by expertise.

Field work

The researcher started to attend the outpatient clinics at Maternity Hospital -Ain Shams university to collect data from May 2022 till August 2022 which covered 4 months. The researcher attended 3days/week from 9am - 2 pm. The duration for each interview was 30 minutes, depending on the tolerance and willingness of the participant. At the beginning of interview, the researcher introduced herself, briefly explained the aim of the study to each pregnant woman to gain woman's confident and trust to participate in the study then oral consent of each woman was obtained. Firstly, the researcher assessed women's general characteristics, previous and current obstetric history, women's knowledge regarding preeclampsia, and barriers that preventing preeclamptic women to comply with antenatal care by using tool I (structured interviewing questionnaire). It was taken 10–15 minutes to fill by the researcher. Then, the researcher started to assess healthy and unhealthy behavior of women regarding preeclampsia by using tool II (A Healthy and Unhealthy behavior Scale). It was taken 10–20 minutes to fill.

Statistical Design

The statistical analysis of data was done by using the computer software of Microsoft Excel Program and Statistical Package for Social Science (SPSS) version 25. Data were presented using descriptive statistics in the form of frequencies and percentage for categorical data, the mean (X) and standard deviation (SD) for quantitative data. Qualitative variables were compared using chi square test (X) 2, P-value to test association between two variables and Pearson correlation test (R- test) to the correlation between the study variables. Degrees of significance of results were considered as follows:

- P-value > 0.05 Not significant (NS)
- P-value ≤ 0.05 Significant (S)
- P-value ≤ 0.01 Highly Significant (HS).

Limitations of the study

No specific limitation meet researcher while implementing the study, but there was challenging to facilitate the interview place by lack of stable place in the Outpatient clinic. Sometimes there is noise and individuals' interruption during the interview with mothers. Moreover, some participants attended with their children. They were distracted during the interview.

Results:

Table (1) shows that, 43.5% of the studied sample their age was 25 -< 30 years with the mean age was 28.74 ± 5.51 years. As regard to educational level, 60.8% of them had university education. Also, 60.8% of them were housewife. Moreover, 59.1% of studied sample lived in rural areas.

Table (2) illustrates that 57.5% and 81.2% of the studied sample had correct answers regarding preventive measures for preeclampsia as the food must be avoided and the appropriate place of birth, respectively. 51.6%, 70.4%, 58.1%, 78.5%, and 70.4% of the studied sample had incorrect answers regarding the meaning of preeclampsia, risk factors of preeclampsia, the signs & symptoms, the complications for the mother, and the complications for fetus, respectively. Moreover, 57.0% of the studied women had incorrect answers regarding preventive measures of preeclampsia

Figure (1) shows that 66.7% of the studied sample had incorrect total knowledge about pre-eclampsia and 33.3% of them had correct knowledge.

Figure (2) shows that 53.8% of the studied sample had total unhealthy behavior and 46.2% had total healthy behavior.

Table (3) illustrates healthy and unhealthy behavior among preeclamptic women regarding to physical activity 53.8%, 52.8%, and 75.3 % of the studied sample reported sometimes get exercise during usual daily activities and frequently raise legs to relieve edema, always taking shower bath 3 times per week in hot weather and 2 times in cold weather respectively. In addition, regarding to nutrition 58.6% and 57.0% of them reported sometimes eat 2-3 servings of milk, yogurt, cheese or eggs each day and sometimes eat only 1 serving of the meat, poultry, fish each day, respectively.

Table (4) demonstrates that concerning moral development 71.5% and 71.0% of the studied sample reported sometimes feel growing and changing in positive ways during pregnancy and sometimes feel content and at peace toward present pregnancy, respectively. In addition, 73.1% and 59.7% of studied sample reported that always show concern, love and warmth to others and always get support and cooperation from their husband, friends and family as interpersonal communications, respectively.

Table (5) displays that regarding stress management 57.5% of the studied sample reported sometimes self-coping and healthy adaptation with stress and tension and sometimes concentrate on happier and pleasant events at bedtime, respectively. In In addition, 83.3% and 68.3% of studied sample reported that always prefer hospital births rather than home births and always consider frontal headache, edema, epigastric pain and convulsion as warning signs of preeclampsia that need immediate medical consultation as health duties, respectively. Moreover, 53.8% and 99.5% of studied sample never check and record weight daily and didn't check urine for proteinuria by dipstick daily, respectively.

Figure (3) shows that 51.6% and 52.2% of the studied sample had unhealthy behavior regarding physical activity and nutrition, respectively. In addition, 51.6% and 73.1% of them had unhealthy behavior regarding moral development and stress management, respectively. While 59.1% and 51.6% of them had healthy behavior regarding interpersonal communications and health duties, respectively.

Table (6) demonstrates that regarding economic barriers 85.5% of the studied sample reported the high costs of follow-up, treatment, and medical examinations. In addition, regarding social barriers 71.5% of the studied sample reported lots of household responsibility. Furthermore, 55.4% and 68.3% of studied sample reported that fear of examination, medication, and its side effects on the health of the fetus and cultural beliefs of unwillingness for examination by a male doctor as psychological and cultural barrier, respectively. Moreover, regarding to health services related barriers 57.5% and 54.3% of the studied sample reported that overcrowding & unavailability of a comfortable chairs in the outpatient waiting area and not giving enough guidance as place, policies and procedures barrier that prevent them to comply with antenatal care, respectively.

Table (7) indicate that, there was highly significant positive correlation between total knowledge of the studied sample about pre-eclampsia and their total healthy behavior at (P= < 0.01).

Table (8) detects that, there was highly significant negative correlation between high costs of follow-up, treatment and medical examinations, lots of household responsibilities and fear of examination, medication, and its side effects on the health of the fetus and total knowledge, total healthy behavior among studied women at (P= < 0.01). Also, there was highly significant negative correlation between too long Waiting time, not giving enough guidance and cultural beliefs of unwillingness for examination by a male doctorand total knowledge, total healthy behavior among studied women at (P= < 0.01).

Table (1): Distribution of the studied sample according to their general characteristics **(n = 186).**

General characteristics	No.	%
Age (years)		
18 -< 25	47	25.3
25 -< 30	**81**	**43.5**
30 – 35	58	31.2
Mean SD **28.74 ± 5.51**		
Educational level		
Do not read or write	4	2.2
Read or write	11	5.9
Primary education	9	4.8
Secondary education	49	26.3
University education	**113**	**60.8**
Occupation		
Worker	73	39.2
Housewife	**113**	**60.8**
Residence		
Rural area	**110**	**59.1**
Urban area	76	40.9

Table (2): Distribution of the studied sample according to their knowledge about pre-eclampsia **(n=186).**

Items	Correct		Incorrect	
	No.	%	No.	%
Definition of preeclampsia	90	48.4	**96**	**51.6**
Risk factors of preeclampsia	55	29.6	**131**	**70.4**
The signs & symptoms	78	41.9	**108**	**58.1**
Complications for mother	40	21.5	**146**	**78.5**
Complications for fetus	55	29.6	**131**	**70.4**
The food must be avoided	**107**	**57.5**	79	42.5
The pre-eclampsia prevention methods	80	43.0	**106**	**57.0**
The appropriate place for pre-eclampsia births	**151**	**81.2**	35	18.8

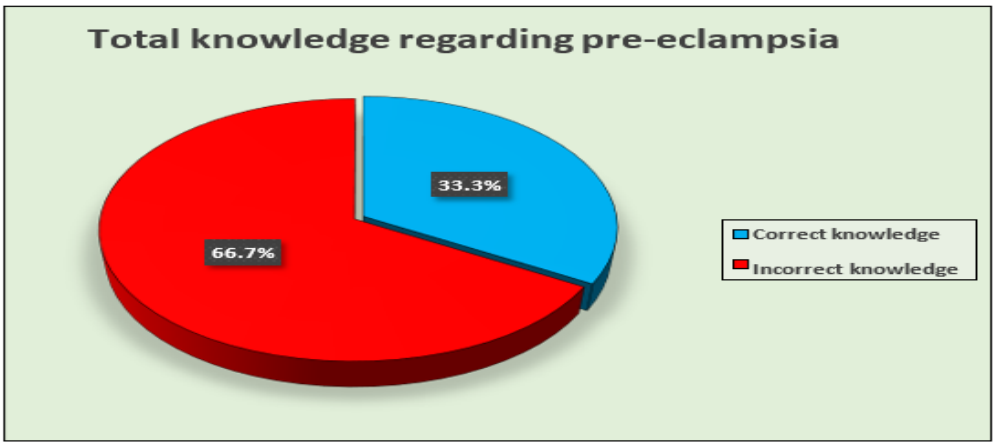

Figure (1): Percentage distribution of the studied sample according to their total knowledge regarding pre-eclampsia **(n = 186).**

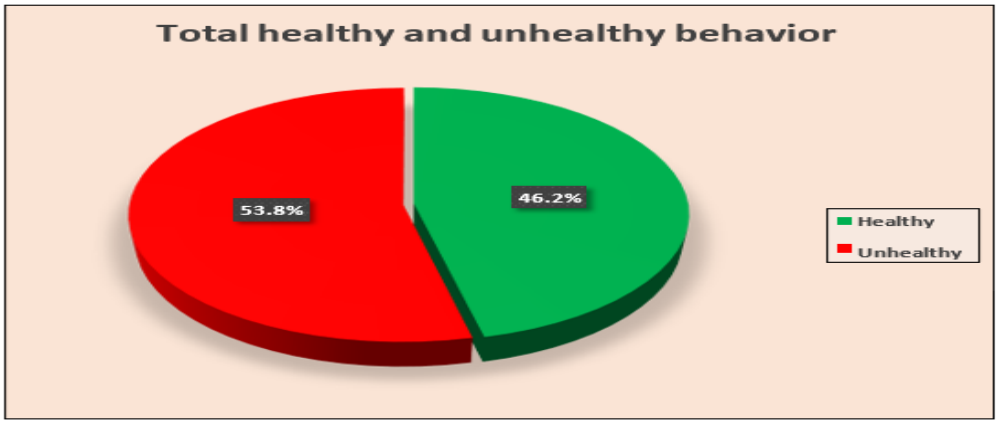

Figure (**2**): Percentage distribution of the studied sample according to their total healthy and unhealthy behavior **(n = 186).**

Table (3): Distribution of the studied sample according to their physical activity and nutrition **(n = 186).**

Items	Always		Sometimes		Never	
	No.	%	No.	%	No.	%
Physical activity						
Participating in regular physical activity	7	3.8	86	46.2	93	50.0
Get exercise during usual daily activities (such as walking after lunch, using stairs instead of elevators, walking instead of car).	39	21.0	**100**	**53.8**	47	25.2
Avoid hard and heavy home activities.	81	43.5	79	42.5	26	14.0
Take part in light to moderate physical activity (such as sustained walking 30-40 minutes 5 or more times a week).	20	10.8	83	44.6	83	44.6
Frequency raise legs to relieve edema	39	21.0	**100**	**52.8**	47	25.2
Lie in left lateral position at least 3 4 time a day	58	31.2	95	51.1	33	17.7
Taking shower bath 3 times per week in hot weather and 2 times in cold weather.	**140**	**75.3**	45	24.2	1	0.5
Nutrition						
Consuming the recommended preeclampsia diet (high protein, low salt, low fat, low sugar)	60	32.3	101	54.3	25	13.4
Drinking 8 to 10 glasses of water daily	105	56.4	76	40.9	5	2.7
Eat 1–2 servings of bread, cereal, rice and pasta each day.	64	34.4	103	55.4	19	10.2
Eat 2-4 servings of fruit and vegetables each day.	73	39.2	104	55.9	9	4.9
Eat 2-3 servings of milk, yogurt, cheese or eggs each day.	51	27.4	**109**	**58.6**	26	14.0
Eat only 1 serving from the meat, poultry, fish each day.	66	35.5	**106**	**57.0**	14	7.5
Avoid snacks, spicy and uncooked food	62	33.3	89	47.9	35	18.8
Cook food with olive oil and avoid butter	21	11.3	78	41.9	87	46.8

Table (4): Distribution of the studied sample according to their moral development and interpersonal communications **(n = 186).**

Items	Always		Sometimes		Never	
	No.	%	No.	%	No.	%
Moral Development						
Feel I am growing and changing in positive ways during pregnancy.	47	25.3	**133**	**71.5**	6	3.2
Pregnancy makes my life has purpose	121	65.1	48	25.8	17	9.1
Look forward to the future pregnancy and encourage child spacing	98	52.7	61	32.8	27	14.5
Feel content and at peace toward my present pregnancy	42	22.3	**132**	**71.0**	12	6.5
Find each day in this present pregnancy interesting	71	38.2	76	40.8	39	21.0
Am aware of the important things that I need for my healthy life during pregnancy.	77	41.4	91	48.9	18	9.7
Pregnancy exposes myself to new experiences and Challenges	89	47.8	79	42.5	18	9.7
Interpersonal communications						
Spend my spare time with my friends and family.	56	30.1	106	57.0	24	12.9
Promote meaningful and fulfilling relationships with my family and others.	91	48.9	76	40.9	19	10.2
Show concern, love and warmth to others.	**136**	**73.1**	44	23.7	6	3.2
Get support and cooperation from my husband, my friends and my family.	**111**	**59.7**	64	34.4	11	5.9
Discuss my special needs with my husband.	97	52.2	73	39.2	16	8.6
Discuss my special health concerns with health team and follow their advices.	88	47.3	86	46.2	12	6.5

Table (5): Distribution of the studied sample according to their stress management and health duties **(n = 186).**

Items	Always		Sometimes		Never	
	No.	%	No.	%	No.	%
Stress management						
Self-coping and healthy adaptation with stress and Tension	51	27.4	**107**	**57.5**	28	15.1
Feel comfort with health care during my pregnancy associated with preeclampsia.	58	31.2	101	54.3	27	14.5
Concentrate on happier and pleasant events at bedtime	42	22.6	**107**	**57.5**	37	19.9
Balance time between my work and play to prevent stress and tiredness	49	26.4	96	51.6	41	22.0
Taking rest and adequate sleep each day	81	43.5	90	48.4	15	8.1
Use healthy methods to overcome my stress such as prayer, Quran, and meditation	88	47.3	88	47.3	10	5.4
Accept the challenges in my life that I cannot change.	72	38.7	92	49.5	22	11.8
Health Duties						
Watch TV health programs and attend educational programs to improve my health behavior.	11	5.9	86	46.2	89	47.9
Regular self-body exam for abnormality like edema and consult health team.	83	44.6	76	40.9	27	14.5
Comply with Preventive measures to avoid corona virus infection.	73	39.3	83	44.6	30	16.1
Compliance with recommended antenatal visits and vaccination	119	64.0	56	30.1	11	5.9
Counting fetal kicks daily and report any abnormality to health team	64	34.4	85	45.7	37	19.9
Prefer hospital births rather than home births	**155**	**83.3**	24	12.9	7	3.8
Consider frontal headache, edema, epigastric pain and convulsion as warning signs of preeclampsiathat need immediate medical consultation.	**127**	**68.3**	44	23.6	15	8.1
Compliance with prescribed medications	118	63.4	61	32.8	7	3.8
Measuring blood pressure daily	21	11.3	96	51.6	69	37.1
Checking and recording weight daily	5	2.7	81	43.5	**100**	**53.8**
Checking urine for proteinuria by dipstick daily	0	0.0	1	0.5	**185**	**99.5**

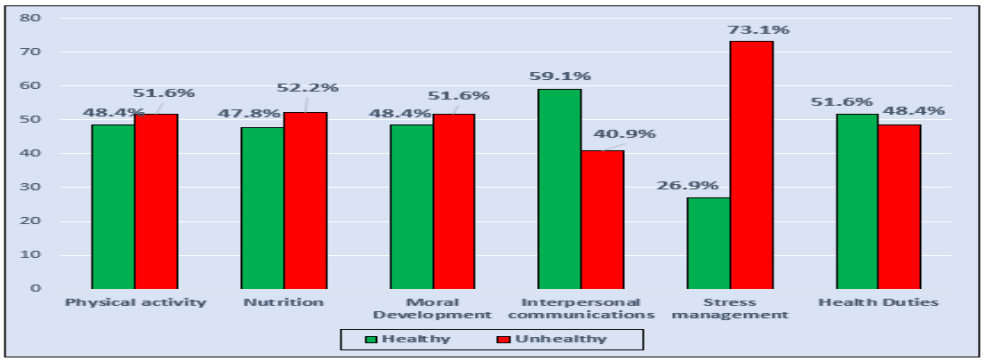

Figure (3): Percentage distribution of the studied sample according to their total subscales of healthy and unhealthy behavior **(n = 186).**

Table (6): Distribution of the studied sample according to their barriers thatpreventing them to comply with health behavior **(n = 186).**

Items	Yes		No	
	No.	%	No.	%
Economic barriers				
Low monthly income for the family	66	35.5	120	64.5
Transportation cost	25	13.4	161	86.6
The high costs of follow-up, treatment and medical Examinations	**159**	**85.5**	27	14.5
Social barriers				
Lots of household responsibilities	**133**	**71.5**	53	28.5
Lots of young children and taking care of them	33	17.7	153	82.3
The nature of work for the mother	60	32.3	126	67.7
Refusal of the mother-in-law	6	3.2	180	96.8
Husband's refusal	5	2.7	181	97.3
Psychological barriers				
Unwanted current pregnancy	13	7.0	173	93.0
Fear from infection of corona virus due to overcrowded clinic waiting area	72	38.7	114	61.3
Fear of examination, medication, and its side effects on the health of the fetus	**103**	**55.4**	83	44.6
Fear of pain during examination	75	40.3	111	59.7
Marital problems	14	7.5	172	92.5
Health services related barriers. Place				
The distance of the place	57	30.6	129	69.4
Overcrowding &Unavailability of a comfortable chairs in the outpatient waiting area	**107**	**57.5**	79	42.5
Too long Waiting time	117	62.9	69	37.1
Policies and Procedures				
Hospital policy prevents present companionship during Examination	40	21.5	146	78.5
No privacy during the examination	85	45.7	101	54.3
Lack of attention from the doctor	23	12.4	163	87.6
Lack of care from the nurse	34	18.3	152	81.7
Not answering questions	51	27.4	135	72.6
Not giving enough guidance	**101**	**54.3**	85	45.7
Too much time taken during the examination	28	15.1	158	84.9
Religious and Cultural barriers				
Beliefs that pregnancy is normal phenomena that do not need health service	60	32.3	126	67.7
Inherited misconception and trust to traditional daya for managing pregnancy complications	11	5.9	175	94.1
Cultural beliefs of unwillingness for examination by a male doctor	**127**	**68.3**	59	31.7

Table (7): Correlation between total knowledge of the studied sample about pre-eclampsia and their total healthy behavior **(n=186).**

Items	Total healthy behavior	
	R	P-value
Total knowledge	0.495	0.000**

r= correlation coefficient test. **highly significant at p ‹ 0.01.

Table (8): Correlation between total knowledge, total healthy behavior and barrier that prevent women to comply with health behavior **(n=186).**

Items	Total knowledge	Total healthy behavior
The high costs of follow-up, treatment and medical examinations	r = -.428 P = .003**	r = -.514 P = .003**
Lots of household responsibilities	r = -.525 P = .000**	r = -.605 P = .000**
Fear of examination, medication and its side effects on the health of the fetus	r = -.434 P = .000**	r = -.478 P = .000**
Too long Waiting time	r = -.508 P = .001**	r = -.518 P = .001**
Not giving enough guidance	r = -.499 P = .000**	r = -.503 P = .000**
Cultural beliefs of unwillingness for examination by a male doctor	r = -.529 P = .000**	r = -.611 P = .000**

r= correlation coefficient test **highly significant at p ‹ 0.01.

Discussion

The current study was performed to investigate healthy and unhealthy behaviors among preeclamptic women. This aim of the present study was achieved through the present study findings.

Regarding general characteristics of studied sample, the current study reported that less than half of the studied women their age is 25 to 30 years with the mean age is 28.74 ± 5.51 years, near to two third of them were university educated and housewife, also, more than half of them live in rural areas.

These study results were in harmony with **Ahmed et al., (2018)** who studied Predict Risk Factors of Preeclampsia Among Pregnant Women Attended Antenatal Clinic at Assiut University Hospital and stated that less half of the studied women their age is from 25-30 years with mean age is 27.47 ± 5.65 (17.0 – 42.0) years and illustrated that PE is more developed among pregnant women from rural area (more than three fifth) which is due to negative behavior for seeking of care and lack of health care

facilities and well trained personal in rural areas

Additionally, the present study was in the same line with **Putra et al., (2020)** who conducted a cross sectional study of 79 pregnant mother in their first and second trimester to find connection between health literacy and pre-eclampsia knowledge of pregnant mother in primary health care in surabaya and demonstrated that more than half of participant were housewives.

But the current study results disagreed

with **Afefy & Kamel et al., (2019)** who conducted quasi- experimental design one group (time series) of 100 preeclamptic women attending antenatal clinics at Cairo university hospitals, Egypt to evaluate effect of an educational module on the knowledge and self-care of women suffering from pre-eclampsia and revealed that more than half of study sample were with low level of education and two third of them were from urban areas.

The first research question was what is the women's knowledge regarding preeclampsia?

As regards women's knowledge regarding preeclampsia, this is a significant answer the present study research findings illustrated that more than half among the studied sample had correct knowledge regarding the food that must be avoided and the majority among them had correct knowledge regarding the appropriate place for births.

The current study result was similar to ***Hussian & AlSaffar, (2016)*** who conducted a descriptive study of 100 pregnant women and stated that a high percentage of the studied sample had high and moderate knowledge regarding intake of food patterns. The similarity between the present study and the previously mentioned author due that they follow the same methodology and the same aim.

In addition, the current study finding demonstrated that more than half among the studied sample had incorrect knowledge regarding the meaning of preeclampsia, its signs & symptoms, while less than three-quarters among them had incorrect knowledge regarding risk factors of preeclampsia and the complications of preeclampsia for the fetus, additionally, more than three-quarters among them had incorrect knowledge concerning the complications of preeclampsia for mother.

These results might be due to the majority among studied sample were from rural areas where it's immoral Egyptian community to discuss issue related to reproductive health among young rural females.

The present study finding was consistent with ***Nagwa & Amel, (2019)*** who reported that more than half among the studied sample didn't know the meaning of pre-eclampsia, its causes, or even its features before their intervention. The reason behind this in the researcher's mind could be due to health illiteracy among studied sample.

Additionally, the current result was agreed with ***Romuald et al., (2019)*** who conducted an observational study and reported that the majority among pregnant women did not know of pre-eclampsia complications specific to pregnancy. This was due to pregnant women had not received detailed health education about pregnancy problems during antenatal follow-up.

Moreover, concerning total knowledge regarding pre-eclampsia, the current study result illustrated that slightly more than two-thirds among the studied sample had incorrect total knowledge about pre-eclampsia. This may be due to more than half among the studied sample being from rural areas that had neglected to attend health educational programs in antenatal care services.

These study results were supported by ***Ngouakam et al., (2021)*** who conducted a cross-sectional hospital-based study and reported that slightly more than two-thirds among the studied sample had inadequate knowledge of preeclampsia. The researcher explained that the lack of knowledge may be due to a lack of planned recommended preeclampsia educational programs among pregnant women.

On the other hand, this study finding was opposite to **a recent survey in the United States of America 2019** where the majority among respondents was aware of pre-eclampsia and knew that it is extremely serious and even life-threatening for mothers and babies. The researcher explained the reason behind this could be that the United States a developed nation may have a better structure in creating comprehensive health education among pregnant women on the health conditions at ANC visits.

Moreover, the second research question was what are the healthy and unhealthy behaviors among preeclamptic women?

Concerning total healthy and unhealthy behavior among preeclamptic women, the present study results depicted that more than half among the studied sample had total unhealthy behavior. This may be attributed to a lack of knowledge among pregnant women about preeclampsia because of inadequate

antenatal visits especially more than half among them were from rural areas.

The present study result was matched with ***ELSayed et al., (2020)*** who mentioned that the total health-related behaviors among the participants were low. This may be attributed to a lack of knowledge among pregnant women about preeclampsia and health illiteracy because of inadequate antenatal visits in both groups.

While the present study result was disagreed with ***Iqomatulhaq & Solehati., (2019)*** who discovered that the majority among pregnant women had a high category of healthy living behavior and less than half among pregnant women were still in the low category. This may be due to more than two thirds of studied sample had low education.

Concerning to physical activity dimension, the current study finding showed that more than half among the studied sample had unhealthy behavior regarding physical activity in the form of sometimes getting exercise during usual daily activities (such as walking after lunch, using stairs instead of elevators, walking instead of car) and sometimes frequency raise legs to relieve edema. Lack of physical activity could be due to some limitations of Egyptian traditional community, heavy work home activities, and low level of knowledge about the effect of physical activity in pre-eclampsia management.

The current study finding was similar to ***Iqomatulhaq & Solehati., (2019)*** who discovered that the lowest average score was the physical activity dimensions and most mothers rarely engaged in physical activities. The researcher demonstrated that this may be due to the limitations of mothers who were pregnant that made them lack in performing physical activities.

While this present study result was different with ***Kókai et al., 2022*** who studied Perceived determinants of physical activity among women with prior severe preeclampsia: a qualitative assessment and reported that approximately one-third of participants had high level of physical appearance and engaging in sufficient levels of moderate to-vigorous physical activity. This result may be due to the majority of studied sample had high educational level.

In addition, in the nutrition dimension, the current study result showed that more than half among the studied sample had unhealthy behavior regarding nutrition as sometimes eating 2-3 servings of milk, yogurt, cheese, or eggs each day and sometimes eating only 1 serving from the meat, poultry, and fish each day.

The current study finding was agreed with ***Samur et al., 2019*** who studied nutritional status among women with preeclampsia and healthy pregnant women Progress in Nutrition and discovered that the majority of women with PE had high level of unhealth behavior related nutritional status compared to healthy pregnant women. This is explained by low level of knowledge about recommended health nutritional requirements for preeclampsia due to not attending health education programs in ANC services.

Additionally, in the moral development dimension, the current study finding presented that more than half among the studied sample had unhealthy behavior regarding moral development in form of sometimes felt growing and changing in positive ways during pregnancy and sometimes feeling content and at peace toward the present pregnancy.

The present study finding was inconsistent with ***Iqomatulhaq & Solehati., (2019)*** who found that the spiritual growth dimension had the highest average score and almost all pregnant women had a high level of spiritual growth. This may be due to the majority among respondents being Muslim and respecting to pray always, so they could cope with stress well, and the risk of preeclampsia decreases.

Furthermore, in the interpersonal communications dimension, the study results showed that more than half among the studied sample had healthy behavior regarding interpersonal communication in form of always getting support and cooperation from husband, friends, and family and more than two-thirds among them reported always show concern, love, and warmth to others.

Similarly, the present study finding was supported by ***Qureshi et al., (2020)*** who conducted a cluster randomized controlled trial to assess Community-level interventions for pre-eclampsia (CLIP) in Pakistan and revealed the importance of husbands and mothers-in-law as the closest people to pregnant women with preeclampsia and as decision-makers in the use

of health services.

Moreover, concerning stress management dimension**,** the current study finding showed that more than half among the studied women had unhealthy behavior regarding stress management as a sometimes self-coping and healthy adaptation to stress and tension and sometimes concentrate on happier and pleasant events at bedtime.

This study's finding was contradicted by the research of ***Iqomatulhaq & Solehati., (2019)*** who mentioned that the studied sample had good stress management. Good stress management in pregnant women with a high risk of preeclampsia is important because stress management affects three factors which are physical, psychological, and social relations.

Regarding the health duties dimension, the current study finding showed that more than half among the studied sample had unhealthy behavior regarding checking and recording weight daily, and all studied sample never self-examined urine for proteinuria by dipstick daily. While the other studied sample had healthy behavior regarding preferring hospital births rather than home births and considered frontal headache, edema, epigastric pain, and convulsion as warning signs of preeclampsia that need immediate medical consultation.

The current study was parallel to ***Afefy & Kamel., (2019)*** who found that less than two-thirds among the studied sample had never checked weight daily and never checked urine for protein daily. This may be interpreted by the majority of women who had inadequate self-care practice levels regarding preeclampsia.

Furthermore, the third research question was what are the reasons of preeclamptic women to attend health service?

The current study results revealed that most of studied sample attended antenatal follow-up due to pregnancy complications.

These results were similar to ***Romuald et al., (2019)*** who found that the majority among studied sample did follow-up during current pregnancy due to complications. This is explained by few patients are aware of this condition and its complications, due to lack of education especially during prenatal consultation.

Concerning the fourth research question was what are the barriers for preeclamptic women to seek health services?

The main barriers among the studied sample were economic, social, psychological, religious, cultural, and health-related barriers.

Regarding economic and social barriers, the present study results depicted that the majority among studied sample reported high costs of follow-up, treatment, and medical examinations and less than a quarter among them recorded lots of household activities. This may be due to the majority among studied women being from rural areas, unavailability of antenatal clinics, and women need highly cost for transportation to go to antenatal care facilities.

The current study was in the same line with ***Mekie et al., (2022)*** who conducted a qualitative study among 20 purposively selected pregnant women who reported that transport problems, low socioeconomic conditions, and poor access to health facilities were the main barriers to early health-seeking behavior related to preeclampsia.

Concerning psychological barriers, the present study result stated that more than half among the studied women reported fear of examination, medication, and its side effects on the health of the fetus. This indicates that psychological barriers were crucial in preeclampsia management.

On the same line ***Muhwava et al., (2016)*** who examined psychosocial factors associated with early initiation and frequency of antenatal care (ANC) visits in a rural and urban setting in South Africa demonstrated that individual-level psychosocial factors such as fear from medical examination was more likely to be associated with timing of ANC initiation. The researcher explained this as the majority among the studied sample were from rural communities that had the misconception that medications may be more harmful to babies and may cause deformities, especially in the first weeks of pregnancy.

Regarding health services-related reasons, the current study finding was revealed that more than half among the studied women reported overcrowding & unavailability of a comfortable chair in the outpatient waiting area and not giving enough guidance. This may be related to most healthcare facilities having insufficient staff and training and limited physical space making it challenging to

accommodate a large number of patients.

This study result was in agreement with ***EL sebaey et al., (2021)*** who performed a descriptive study design of a convenient sample of 60 nurses and reported that healthcare facilities, infrastructure, and system positively affect antenatal care which imply that healthcare setting should be equipped with suitable, comfortable units and clear policies and procedures that guarantee the feasibility of antenatal care of patients.

Additionally, in religious and cultural barriers, the current study results noted that two-thirds among the studied women reported cultural beliefs of unwillingness to be examined by a male doctor. This may be due to women feeling shame and embarrassment to be examined by male doctor while feel more comfortable to discuss intimate health issues and undergoing physical examinations with a female doctor due to cultural and religious norms that live on rural and personal preferences.

According to ***Walton & Brown., (2012)*** Islamic cultures strongly affect health beliefs, attitudes, and perceptions of maternal health. Therefore, to be considered women, maternal health care information must be presented in a culturally and religiously regionally appropriate format. Therefore, that is useful to patients and healthcare providers in order to be efficient and effective.

While the fifth research question was What are the relation between pre-eclamptic women's knowledge, healthy & unhealthy behavior, and the barriers to seeking health?

Concerning to correlation between total knowledge and total healthy behavior, the current study finding demonstrated a highly significant positive correlation between the total knowledge among the studied women about pre-eclampsia and their total healthy behavior. This may be due to obtaining pre-eclampsia information increases the self-determination of pregnant women and improves compliance with health behaviors and treatment.

The present result was in the same line with ***ELSayed et al., (2020)*** who demonstrated a significant positive correlation between the total scores of health-related behaviors regarding preeclampsia and quality of life in both groups before and after continuous care model implementation.

sThe present study findings were accepted by ***Lotfy & Mostafa., (2021)*** who studied the Effect of Lifestyle Alteration of Pregnant Women with Mild Preeclampsia on Maternal and Fetal Status and revealed that there was a positive correlation between counseling sessions for pregnant women with mild preeclampsia on lifestyle changes, maternal and fetal status.

Furthermore, concerning to correlation between total knowledge, total healthy behavior, and barriers that prevent preeclamptic women from complying with health care**,** the current study finding detected there was a highly significant negative correlation between barriers that prevent preeclamptic women from complying with health behavior and total knowledge, total healthy behavior among studied women.

The current study finding was in the same line with ***Ogunba and Abioduat, (2017)*** who studied Knowledge and Attitude of Women and Its Influence on Antenatal Care Attendance in Southwestern Nigeria and reported that there was no significant relationship between knowledge and the attendance to antenatal clinic care.

While this study result was in opposition to this finding by ***Owusu et al., 2021*** who conducted descriptive cross-sectional survey design and found that the level of mother's knowledge on ANC services was found to be significantly associated with ANC service attendance as mothers with poor knowledge were about 95.8% less likely to attend ANC compared to mothers with high knowledge about ANC services. Differences in results could be due to differences in environmental and cultural issues.

In light of these results, the present study pointed out an attention to the importance of healthy behavior among preeclamptic women. This is due to the majority of the studied sample being from rural areas where it was unnecessary to discuss issues related to reproductive health among young rural females. This stressed the importance of programs to correct women's misconceptions related to preeclampsia.

Conclusion

The aim of the present study was achieved through the current study's findings. It was observed that more than two-thirds of the study subjects had incorrect total knowledge

about pre-eclampsia while one-third of them had correct total knowledge about pre-eclampsia. Additionally, the present study results depicted that more than half of the studied women had unhealthy behavior and less than half of them had healthy behavior. Furthermore, the current study indicated that there was a highly significant positive correlation between the total knowledge of the studied sample about pre-eclampsia and their total healthy behavior at (P= < 0.01).

Recommendation

In light of findings of this study, the following recommendations are suggested:

- Outreach and rising awareness programs related to knowledge, self-care measures, and health behaviors must be designed and implemented to correct unhealthy behaviors and promote healthy ones among preeclamptic women at outpatient clinic.
- Developing guidelines, booklets, and brochures regarding healthy and unhealthy behaviors for preeclampsia to be distributed among pregnant women at ANC.

Further research:-

- Reapplication of the present study on other large sample at more than geographical area at Egypt.

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