EFFECT OF LIFESTYLE MODIFICATION GUIDELINES ON MATERNAL AND FETAL OUTCOMES AMONG PREGNANT WOMEN WITH MILD PREECLAMPSIA

Sally Ebrahim Rashad Ali[1], Ragaa Ali Mohamed Abdraboo[2], Nagat Salah Shalaby[3], Inaam Hassan Abdelati[4]

MSN, RN, Manzala General Hospital, Dakahlia, Egypt[1].

Professor of Maternal & Newborn Health Nursing, Faculty of Nursing, October 6 University[2].

Assistant Professor of Maternity, Gynecology, and Obstetrics, Faculty of Nursing, Port-SaidUniversity[3].

Assistant Professor of Maternity, Gynecology, and Obstetrics Faculty of Nursing, Port-Said University[4]

ABSTRACT

Background: Preeclampsia had a negative effect on maternal and fetal outcomes; which considered as a life-threatening condition. Lifestyle modifications can reduce the complications of preeclampsia and improve its outcomes. **Aim:** To examine the effect of lifestyle modification guidelines on maternal and fetal outcomes among pregnant women with mild preeclampsia.**Subjects and method: Design:** A Quasi-experimental design was. **Setting:** This study conducted at the antenatal outpatient unit in Port Said Maternity Hospital**. Subjects:** A purposive sample of 80 pregnant women with mild preeclampsia at above mentioned setting, they were assigned equally into two groups; the study group received lifestyle modification guidelines alongside the hospital protocol, while the control group received the hospital protocol only. Four tools were used for data collection, Structured Interviewing Sheet, Lifestyle Checklist, Maternal and Fetal Outcomes Assessment Sheet, and Proposed Lifestyle Modification Guidelines. **Results:** The lifestyle modification lowering the blood pressure, gestational weight gain, and proteinuria. Also, reducing the rate of maternal and fetal complications related to preeclampsia. **Conclusion:** Lifestyle modification in combination with pharmacological treatment are effective and safe protocol in modifying mild preeclampsia. **Recommendations:** Lifestyle modification guidelines are recommended to be included in the hospital protocol for the management of mild preeclampsia and may be added in maternal nursing curricula.

Key Words: Maternal and Fetal Outcomes, Mild Preeclampsia, Lifestyle Modification Guidelines.

INTRODUCTION

Preeclampsia (PE) is an induced pregnancy hypertensin disorder, which may be resolves within six weeks postpartum. In addition, PE are considered a multisystem, progressive disorder, which characterized by elevated blood pressure (BP) (systolic blood pressure (SBP) is equal or more than 140 mmHg, and/or diastolic blood pressure (DBP) is equal or more than 90 mmHg), in previously normotensive women, in the absence of proteinuria or proteinuria +1 with dipstick reading, and edema at 20-24 weeks of gestation (Peres et al, 2018; Norwitz et al, 2020). PE may be a cause of maternal and fetal morbidity and mortality (International Federation of Gynecology and Obstetrics (FIGO), 2019).

Lifestyle is defined as the manner of living among individuals, families, and societies which reflect in coping with their physical, psychological, social, and economic environments on a day-to-day basis. It is expressed in work, activities, attitudes, interests, opinions, values, and allocation of income. Also, it reflects people's self-image or self-concept; the way they see themselves, and believe they are seen by others. It is influenced by with needs, motivations, culture, family, reference groups, social class, behavior, interaction, consumption, social activities, and hoppies (Spacey, 2018).

The recent guidelines of the management of hypertension (HTN), recommended the non-pharmacological treatments (Whelton et al, 2017). Modification of lifestyle is considered the first line management of HTN (Varela et al, 2018) and can reduce the occurrence of HTN. PE is a high-risk pregnancy condition, which needs specific modification of lifestyle in relation to nutrition, physical exercise and activities, smoking cessation, stress reduction. In addition, pregnant women with PE need educational programs regarding the proper lifestyle for PE (Fondjo et al., 2019; Filippou et al., 2020).

SIGNIFICANCE OF THE STUDY

Preeclampsia is one of the most common life-threatening complications during pregnancy. It is a leading cause of maternal and fetal morbidity worldwide. Counseling in early pregnancy is considered vital for maternal and fetal outcomes. Nursing guidelines and counseling sessions for women with high BP during pregnancy have an important role in early control of its subsequent problems. Use of booklets can be a solution for the continuation of effective education as the guidelines become easier to be comprehended and adapted from the booklet and used in everyday life. Hence, the present study through

the light on the effect of lifestyle modification guidelines on maternal and fetal outcomes among pregnant women with mild PE.

AIM OF THE STUDY:

Aim of the current study was to examine the effect of lifestyle modification guidelines on maternal and fetal outcomes among pregnant women with mild preeclampsia.

Research Hypothesis:

Pregnant women with mild PE who will follow lifestyle modification guidelines will show a low risk for developing maternal and fetal complications related to PE than those who don't.

SUBJECTS AND METHOD:

Research Design:

A quasi-experimental (control and study groups) design was adopted in the current study.

Study Setting:

The current study was conducted at the antenatal outpatient unit affiliated to Port Said Maternity Hospital.

Sample:

The study sample included a purposive sample of 80 pregnant women with the following inclusion criteria:

- Pregnant women with mild preeclampsia.
- Gestational age of 20 weeks to 24 weeks.
- Free from any medical and gynecological health problems.

Tools of Data Collection:

Tool (1): Structured Interviewing Sheet.

It was developed to collect the personal data, which include age, occupation, educational level, and marital status, obstetrical data, which contain gravidity, parity, history of abortion, history of preterm deliveries, and inter-pregnancy intervals, and the initial assessment data, which include BP, proteinuria, and weight.

Tool (2): Lifestyle Checklist.

The checklist of lifestyle contains 18 items to assess the lifestyle habits; nutrition (10 items), physical exercise and activities (5 items), and smoking habits (3 items).

Tool (3): Maternal and Fetal Outcomes Assessment Sheet.

It deals with follow up data as BP, proteinuria, and weight. Also, it contains the

maternal outcome as severe PE, eclampsia, altered liver functions, altered kidney functions, and cardiac symptoms, and fetal outcomes as timing of delivery, NICU admission, fetal viability, birth weight, birth length, head circumference, and APGAR scores at 1st and 5th minutes.

Tool (4): Proposed Lifestyle Modification Guidelines.

It was constructed for women with mild preeclampsia to enrich them with knowledge about PE (definition, signs and symptoms, risk factors, and complications) and lifestyle modifications guidelines for PE; instructions regarding the recommended nutrition for preeclampsia, physical exercise (walking for 30 minutes, five days weekly), avoid positive and negative smoking, sleep for 8 hours at night and 2 hours in the daytime, instructions to relieve stress, smoking (avoid positive and negative smoking), measures to relieve signs and symptoms of mild PE and dangerous signs of PE.

Pilot Study:

A pilot study was conducted on eight pregnant women with mild PE 10.0% of the total sample (4) woman to test the feasibility and applicability of the tool, and examine the clarity of the questions. The women who recruited in the pilot study were excluded from the study sample.

Validity:

The tool was reviewed by jury composed of five experts in the field of Maternity & Newborn Nursing and Community Nursing to test the clarity and applicability of the tools.

Reliability:

Reliability was tested by Cronbach's Alpha test to test the reliability of tools through their internal consistency. Cronbach's Alpha test was equal (0.843).

Field work:

The researcher selected women who fulfilled the inclusion criteria from the previously mentioned setting. The collection of data was done, three days weekly, over a period of twelve months from the beginning of March 2020 to the end of February 2021. Participants were assigned into two groups as the first 40 women were recruited in the control group, and the second 40 women were recruited in the study group. All

participants were individually interviewed at the antenatal clinic to collect the general characteristics and clinical data using tool 1; it lasts about 30 minutes.

The participants in the control group were following the hospital protocol for the management of mild PE. While, the participants in the study group were following the hospital protocol for the management of mild PE and they get information individually regarding preeclampsia and the proper lifestyle for PE using tool (4); it lasts about 90 minutes. Guidelines were explained using various methods of health teaching; PowerPoint show and distribution of interventional guideline handout.

Participants in both groups were assessed every two weeks until 36^{th} weeks of gestation, then weekly until delivery for; blood pressure, weight, and proteinuria, and the study group was assured about the importance of continuation of lifestyle modifications. At delivery time, women in the study and control groups were assessed for maternal and fetal outcomes using tool (3). One week after delivery, the lifestyle was assessed in both groups using tool (2); it lasts about 30 minutes.

Ethical Consideration

An approval from the Research Ethics Committee, Faculty of Nursing, Port-Said University was obtained. An official letter from the Dean of the Faculty of Nursing, Port-Said University was directed to the authorities to get their permission to conduct the study. Written approval was obtained from Port Said Maternity Hospital administrators and head of the concerned department. The aim and procedure of the current study was explained to each woman and an oral approval consent was obtained. They were assured about confidentiality and privacy. They have the right to withdraw from the study at any time without any reason.

Statistical Design:

Raw data were coded and computerized in Microsoft Excel 2019. Statistical analysis was done by IBM SPSS version 22.0. Qualitative data were represented using numbers and percentages. Quantitative data were described as mean and standard deviation. Qualitative variables were compared using the qui square test (X^2). An independence t-test was utilized to determine the statistically significant difference between the means within two different groups. A significant level value was considered when the p-value ≤ 0.05, while a highly significant level value was considered when the p-value ≤ 0.001, and p-value > 0.05 indicates non-significant results.

RESULT

Table (1): Shows the personal data of the studied sample. The mean age of the control and study groups was (28.73±6.56 & 29.85±6.99) respectively. In addition, 60.0% & 75.0% of the control and study groups were housewives respectively. Also, 45.0% & 57.5% of the control and study groups had secondary education respectively. It was estimated that, all of them were married.

Table (2): Mentions the obstetrical history among the studied sample. It was observed that, 82.5% & 92.5% of the control and study groups were multigravida respectively, and 72.5% & 57.5% of the control and study groups didn't have history of abortion. The majority of the control and study groups didn't have a history of preterm delivery (97.5% & 87.5%) respectively. In addition, 52.5% & 57.5% of the control and study groups had less than 2 years inter-pregnancy intervals respectively.

Table (3): Clarifies the maternal outcome among the studied sample. There were statistically significant differences among the study group and control group; the study group had lower means of SBP and DBP (145.98±8.32 & 151.75±6.84) & (89.91±3.98 & 93.43±3.42), GWG (13.74±4.48 & 16.10±5.99), and proteinuria (1.67±0.31 & 1.45±0.38) than the control group respectively. As shown in table (3), there were statistically significant differences among the study group and control group regarding severe PE (62.5% & 92.5%), altered liver function (15.0% & 37.5%), tachycardia and palpitation (7.5% & 25.0%) respectively.

Table (4): Shows the fetal outcome among the studied sample. There were statistically significance differences in relation to NICU admission (27.5% & 52.5%), delivery at term (42.5% & 82.5%), birth weight (2121.8±605.3 & 2713.8±516.8), birth length (46.24±3.31 & 47.88±1.64), head circumference (31.64±1.27 & 32.65±0.84), and Apgar scores.

Table (5): Clarifies the lifestyle habits among the studied sample. It was noticed statistically significant differences between the study and control groups in all items of the lifestyle habits; the study group had higher rates of healthy habits than the control group.

Table (1): personal data of the studied sample (n= 80).

Variables	Control Group (n= 40)		Study Group (n= 40)		Significance
	No	%	No	%	
Age (year)					
20-	15	37.5	14	35.0	
26-	9	22.5	6	15.0	X^2= 1.892
31-	8	20.0	7	17.5	P= 0.60
More than 35	8	20.0	13	32.5	
Mean (SD)	28.73±6.56		29.85±6.99		t= 0.742 P= 0.46
Occupation					
Occupied	16	40.0	10	25.0	X^2= 2.051
Housewife	24	60.0	30	75.0	P= 0.23
Educational Level					
Illiterate	2	5.0	4	10.0	
Primary	3	7.5	6	15.0	X^2= 6.443
Secondary	18	45.0	23	57.5	P= 0.09
University	17	42.5	7	17.5	
Marital Status					
Married	40	100.0	40	100.0	

Table (2): obstetrical history of the studied sample (n= 80).

Variables	Control Group (n= 40)		Study Group (n= 40)		Significance
	No	%	No	%	
Gravidity					
Primigravida	7	17.5	3	7.5	X2= 1.829
Multigravida	33	82.5	37	92.5	P= 0.31
Parity					
Nullipara	7	17.5	3	7.5	X2= 1.835
Primipara	11	27.5	12	30.0	P= 0.40
Multipara	22	55.0	25	62.5	
History of abortion					
None	29	72.5	23	57.5	X2= 2.121
Once	5	12.5	9	22.5	P= 0.35
Twice	6	15.0	8	20.0	
History of Preterm Labor					
Yes	1	2.5	5	12.5	X2= 2.883
No	39	97.5	35	87.5	P= 0.20
Pregnancy Interval (year)					
Nulliparous	7	17.5	3	7.5	
Less than 2	21	52.5	23	57.5	X2= 2.691
2 – 5	11	27.5	11	27.5	P= 0.44
More than 5	1	2.5	3	7.5	

Table (3): maternal outcome among the studied sample (n= 80).

Variables	Control Group (n= 40)		Study Group (n= 40)		Significance
	No	%	No	%	
SBP Mean (SD)	151.75±6.84		145.98±8.32		t= 3.388 P= 0.001*
DBP Mean (SD)	93.43±3.42		89.91±3.98		t= 4.251 P= 0.000**
Weight gain Mean (SD)	16.10±5.99		13.74±4.48		t= 1.998 P= 0.049*
Proteinuria Mean (SD)	1.67±0.31		1.45±0.38		t= 2.813 P= 0.006*
Severe preeclampsia					
Yes	37	92.5	25	62.5	X2= 10.323
No	3	7.5	15	37.5	P= 0.001*
Eclampsia					
Yes	1	2.5	0	0.0	X2= 2.051
No	39	95.0	40	100.0	P= 0.152
Altered liver functions					
Yes	15	37.5	6	15.0	X2= 5.230
No	25	62.5	34	85.0	P= 0.022*
Altered kidney function					
Yes	12	30.0	6	15.0	X2= 2.581
No	28	70.0	34	85.0	P= 0.108
Cardiac symptoms					
Yes	10	25.0	3	7.5	X2= 4.501
No	30	75.0	37	92.5	P= 0.034*

Table (4): fetal outcome among the studied sample (n= 80).

Variables	Control Group (n= 40)		Study Group (n= 40)		Significance
	No	%	No	%	
NICU admission					
Yes	21	52.5	11	27.5	X2= 5.208
No	19	47.5	29	72.5	P= 0.022*
Fetal viability					
Alive	37	92.5	39	97.5	X2= 1.053
Stillbirth	3	7.5	1	2.5	P= 0.30
Timing of delivery					
Less than 34 weeks	5	12.5	1	2.5	X2= 13.787
34 – 36 weeks	18	45.0	6	15.0	P= 0.001**
37 – more than 37	17	42.5	33	82.5	
Low birth weight					
Yes	26	65.0	13	32.5	X2= 8.455
No	14	35.0	27	67.5	P= 0.004*
Birth weight					t= 4.669
Mean (SD)	2121.8±605.3		2713.8±516.8		P= 0.000**
Birth length					t= 2.806
Mean (SD)	46.24±3.31		47.88±1.64		P= 0.006*
Head circumference					t= 4.184
Mean (SD)	31.64±1.27		32.65±0.84		P= 0.000**
APGAR score 1st min					
0 – 3	10	25.0	3	7.5	X2= 16.965
4 – 6	22	55.0	11	27.5	P= 0.000**
7 – 10	8	20.0	26	65.0	
APGAR score 5th min					
0 – 3	7	17.5	2	5.0	X2= 13.660
4 – 6	16	40.0	5	12.5	P= 0.001**
7 – 10	17	42.5	33	82.5	

Table (5): Lifestyle habits among pregnant women with mild preeclampsia in the control and study groups (n= 80).

Variables	Control Group (n= 40)		Study Group (n= 40)		Significance
	No	%	No	%	
Nutrition:					
Eating small frequent meals					
Yes	5	12.5	12	30.0	X2= 8.189
Sometimes	13	32.5	18	45.0	P= 0.02*
No	22	55.0	10	25.0	
Eating meat or chicken 2-3 times weekly					
Yes	13	32.5	16	40.0	X2= 9.310
Sometimes	13	32.5	21	52.5	P= 0.01*
No	14	35.0	3	7.5	
Eating more than 2–3 portions of fruits or vegetables daily					
Yes	13	32.5	27	67.5	
Sometimes	12	30.0	8	20.0	X2= 10.700
No	15	37.5	5	12.5	P= 0.005*
Eating fish at least twice weekly					
Yes	12	30.0	19	47.5	
Sometimes	6	15.0	11	27.5	X2= 7.551
No	22	55.0	10	25.0	P= 0.023*
Eating whole grain carbohydrate foods	7	17.5	18	45.0	
Yes	10	25.0	10	25.0	X2= 8.297
Sometimes	23	57.5	12	30.0	P= 0.016*
No					
Consume packaged snacks, cakes, pastries or sugar-sweetened drinks less than 5 times weekly					
Yes	9	22.5	25	62.5	X2= 14.718
Sometimes	12	30.0	9	22.5	P= 0.001*
No	19	47.5	6	15.0	

Table (5): Lifestyle habits among pregnant women with mild preeclampsia in the control and study groups (n= 80) (Cont.,).

Variables	Control Group (n= 40)		Study Group (n= 40)		Significance
	No	%	No	%	
Nutrition:					
Diet low in fat and salt					
Yes	25	62.5	36	90.0	X2= 8.361
Sometimes	8	20.0	2	5.0	P= 0.015*
No	7	17.5	2	5.0	
Consume dairy products daily					
Yes	27	67.5	37	92.5	
Sometimes	11	27.5	3	7.5	X2= 8.134
No	2	5.0	0	0.0	P= 0.017*
Drink 1.5 – 2 L daily					
Yes	20	50.0	33	82.5	X2= 12.122
Sometimes	9	22.5	6	15.0	P= 0.002*
No	11	27.5	1	2.5	
Daily exposure to sun					
Yes	9	22.5	26	65.0	X2= 23.072
Sometimes	7	17.5	10	25.0	P= 0.000**
No	24	60.0	4	10.0	
Physical Exercise:					
Yes	4	10.0	25	62.5	X^2= 34.966
Sometimes	11	27.5	13	32.5	P= 0.000**
No	25	62.5	2	5.0	
Frequency per week					
Two days	3	20.0	0	0.0	
Three days	7	46.7	3	7.9	X^2= 20.907
Four days	3	20.0	10	26.3	P= 0.000**
Five days	2	13.3	23	60.5	
Duration (Min)					t= 7.663
Mean (SD)	17.33±5.94		28.61±4.24		P= 0.000**
Daily Activities					
Yes	8	20.0	25	62.5	X^2= 17.953
Sometimes	10	25.0	9	22.5	P= 0.000**
No	22	55.0	6	15.0	
Sleep:					
Yes	5	12.5	26	65.0	X^2= 27.079
Sometimes	13	32.5	10	25.0	P= 0.000**
No	22	55.0	4	10.0	

Table (5): Lifestyle habits among pregnant women with mild preeclampsia in the control and study groups (n= 80) (Cont.,).

Variables	Control Group (n= 40)		Study Group (n= 40)		Significance
	No	%	No	%	
Smoking:					
Smoker					
No	40	100.0	40	100.0	
Negative smoking					
Yes	32	80.0	26	65.0	X2= 17.095
Sometimes	8	20.0	10	25.0	P= 0.11
No	0	0.0	4	10.0	
Action for negative smoking					
Nothing	13	32.5	2	5.0	X2= 9.928
Go away or ask stop smoking	27	67.5	38	95.0	P= 0.002*

DISCUSSION

Preeclampsia, a hypertensive disorder induced by pregnancy, is a multisystem, progressive disorder characterized by new-onset elevated blood pressure and organ dysfunction in the last half of pregnancy in previously normotensive women (Norwitz et al, 2020). Maternal and perinatal morbidity and mortality may be caused by the effect of preeclampsia (FIGO, 2019). Use of booklets facilitate for the continuation of effective education as the guidelines become easier to be comprehended and adapted from the booklet and used in everyday life (Normayanti et al, 2020).

As mentioned by the findings of the present study, lifestyle modification guidelines lower the mean of SBP and DBP, proteinuria, gestational weight gain (GWG), eliminate the risk of developing severe PE and reduce the alteration of liver functions and cardiac complications with statistically significance. While, there were no statistically significance differences in relation to eclampsia, and altered kidney functions. From the point of view, these findings may be due to lack of awareness and experience regarding the nutritional considerations for mild PE as a high-risk pregnancy condition, which improved by the educational session regarding lifestyle modifications and self-care.

These findings are emphasized by Vamvakis et al (2020) who carried out a randomized controlled trial on 91 adults with hypertension to study the effect of lifestyle modification on HTN; they found that lifestyle modifications lower SBP and DBS. In the

same line, El Sayed and Desoky (2019) conducted a quasi-experimental study on 80 pregnant women with mild preeclampsia Al-Sharkia, Egypt; they concluded that the counselling sessions of lifestyle had a positive correlation on the status of pregnant women with mild PE and lower the readings of SBP and DBS. Furthermore, EL Sayed et al (2020) conducted a quasi-experimental study on a purposive sample of 70 pregnant women with preeclampsia in Benha University Hospital, Egypt, to investigate the effect of implementing continuous care model on health-related behaviors and quality of life among women with preeclampsia. The authors mentioned that the continuous care model had a positive effect on lowering SBP and DBP, and improving preeclampsia.

Furthermore, the findings of this study are consistent with Abdel-Aziza et al (2019) who conducted a randomized controlled intervention trail on 200 pregnant women in Cairo University Hospital, Egypt; they concluded that the dietary counselling reduced the GWG. Also, Horn et al (2018) carried out a randomized clinical trial on 281 participants in Chicago, they recommended that diet and lifestyle interventions prevent excess GWG and benefit mother and child. Moreover, Ferrara et al (2020) in a randomised controlled trial on 5329 pregnant women, observed that diet, physical activity, and stress management reduced the weekly rate of GWG. On the other side, Asci and Rathfisch (2016) conducted a randomized controlled trial on 147 pregnant women; they mentioned that lifestyle interventions show no statistically difference in GWG between the intervention group and control group. With respect, this conflict may be related to different research design, different population and behaviours.

Also, Reda et al (2020) conducted a prospective study on 94 pregnant women in Egypt to assess the association between lipid profile and pregnancy induced hypertensive disorders (PIH); they found a positive association between high lipid and PIH and recommended lifestyle modifications in the reproductive to decreasing the maternal complications during pregnancy PIH. Moreover, Yakout (2016) conducted a quasi-experimental research study on 64 pregnant women with mild preeclampsia to evaluate the effect of physical stretching exercise on fetal and maternal outcomes in Alexandria, Egypt. The researcher observed that practice of stretching physical exercise with mild preeclampsia lowered the means of SBP and DBP and promote the fetal and maternal outcomes.

These findings are supported by Attini et al (2019), they suggested that a low protein-restricted, vegan diet, plant-based diet might contribute to controlling proteinuria in pregnant CKD women. On the other hand, a study adopted by Reshma et al (2012) conducted a study on 30 pregnant women with mild preeclampsia in India; they mentioned that the relaxation therapy included deep breathing, progressive muscle relaxation, and guided imagery shown no significant difference in proteinuria. From the point of view, this conflict may be because the current study, including instructions regarding nutrition and exercise besides stress management.

The findings of the current study emphasized that lifestyle modification guidelines were significantly lower the risk of developing severe. These findings are supported by Mekie et al (2020) who conducted a case-control study on 110 pre-eclamptic women and 220 non per-eclamptic; they found that nutritional counselling during ANC follow-up lower the risk of facing PE among nulliparous. Furthermore, Davenport et al (2018) mentioned that, women who exercise had less risk for developing gestational hypertensive disorders as emphasized in a meta-analysis. In addition, Lewandowska and Wieckowska (2020) studied the influence of smoking on the risk of PE; they concluded that smoking in the first trimester increase the risk of developing PE.

The current study findings are in disagreement with Fulay et al (2018) who concluded that adherence to the DASH diet during early pregnancy does not appear to be protective against hypertensive disorders in pregnancy or other adverse pregnancy outcomes. Also, Mol et al (2016) reported that simple preventive measures, such as low-dose aspirin, calcium, and diet and lifestyle interventions, show small benefit. Moreover, Vollebregt et al (2010) reported that physical activity in pregnancy does not reduce the incidence of PE or gestational hypertension in nulliparous women. These differences may be due to different designs and methodologies of research, including the general characteristics of the studied sample, could have influenced the discrepancy.

Concerning the fetal outcome, lifestyle modification reduces the risk of NICU admission, prematurity, as well as, improves the birth weight and length, head circumference, and APGAR score. In the same line, Kibret et al (2018) found that healthy dietary pattern was significantly associated with lower risk of preterm birth and decrease the likelihood of adverse pregnancy and outcomes as observed in a metanalysis of seven studies. Additionally, in a metanalysis of six studies, Li et al (2020) observed that

following the DASH diet decreased the risk of macrosomia, small for gestational age, and improve newborn growth.

The current study is coordinated with Asker et al (2018), who carried out a prospective, randomized, controlled clinical trial on thirty pregnant women with preeclampsia in Mansoura University Hospital, Egypt, to assess the effect of maternal exercise program on fetal growth in pre-eclampsia; they concluded that the maternal exercise program was significantly improves the fetal growth measurements in PE. Moreover, Yang et al (2020) emphasized that maternal smoking related complications were neonatal morbidity, low birth weight, and premature delivery as shown in a cross-sectional study in China. Also, it was associated with miscarriage, stillbirth, placental abruption, preterm birth, low birth weight and neonatal morbidity and mortality (McDonnell & Regan, 2019; Singh et al, 2020).

In contrary, Kasawara et al (2013) mentioned that, there was no association between physical activities and maternal outcomes, including maternal morbidity and hospitalization in intensive unit care, and neonatal outcomes in relation to weight at birth, premature babies, Apgar score at 1^{st} and 5^{th} minutes, hospitalization in NICU, and neonatal morbidity. Furthermore, Thangaratinam et al (2012) conducted a randomized control trial to study the effect of diet, physical activities, and a mixed approach on maternal and fetal outcomes. They found no significant difference in birth weight and small for gestational age.

As reported by the findings of this study, the lifestyle habits were statistically improved among the study group than the control group with statistically significant as a result of the educational sessions regarding the appropriate lifestyle modifications for PE, which enrich them with knowledge regarding lifestyle modification. It was estimated that the minority of the study group didn't modify their habits; this may be due to the physiological changes accompanied with pregnancy, and signs and symptoms of PE. Preeclampsia is a high-risk pregnancy condition, which needs specific modification of lifestyle. In addition, pregnant women with PE need an educational programme regarding the proper lifestyle for PE.

The current study findings in agreement with Afefy and Kamel (2019), who study the effect of an educational module on the knowledge and self-care of women suffering from PE on a sample of one hundred women in Cairo University Hospital, Egypt, they

found that the educational session improve the level of knowledge regarding PE and measures of self-care. In addition, Helmy and Ibrahim (2020) assessed the effect of the health promotion model and self-determination theory-based intervention on PE prevention among 60 pregnant women with PE in Beni-Suef Governorate, Egypt; they noticed that the intervention had an effective improvement of pregnant women's knowledge, change behavior, and dietary practices.

Furthermore, Alnuaimi et al (2020), conducted a randomized controlled trial on 113 Jordanian women; they found that PE educational programme were significantly increase the awareness regarding PE and self-monitoring. Also, these findings are going in the same line with Ahmed (2016) who carried out a quasi-experimental study to evaluate the effect of counselling intervention on women's knowledge, practices, and lifestyle among Primigravidae; the author found that the application of the counselling increased the level of woman's knowledge, health practices and lifestyle.

CONCLUSION

Lifestyle modification guidelines alongside pharmacological treatment protocol are effective and safe management plan for pregnant women with mild PE to reduce the adverse effect of PE on both mother and fetus. Health educational sessions about lifestyle modification should be implemented to pregnant women with mild PE.

RECOMMENDATIONS

Based on the findings of the present study, the following recommendations were suggested:

- Include Lifestyle modification guidelines to the hospital protocol for the management of mild preeclampsia and may be added in maternal nursing curricula.
- Conduct training programs regarding lifestyle modification for mild preeclampsia to maternity nursing staff.
- Educate pregnant women with mild preeclampsia about the proper lifestyle throughout printed booklets or brochures.

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تأثيرارشادات تغيير نمط الحياة على نتائج الأم والجنين بين النساء الحوامل المصابات بتسمم الحمل الخفيف

سالى ابراهيم رشاد على، رجاء على محمد عبد ربه، نجاة صلاح شلبى، انعام حسن عبد العاطى

الخلاصة

تسمم الحمل له تأثير سلبي على كل من الأم والجنين، قد تؤدي إلى الوفاة. يمكن أن تؤدي إرشادات تغيير نمط الحياة إلى تحسين تسمم الحمل وتجنب مضاعفاته. تم تصميم هذه الدراسة شبه التجريبية لتقييم تأثير إرشادات تغيير نمط الحياة على تحسن تسمم الحمل. نفذت هذه الدراسة على عينة قوامها 80 سيدة حامل تعاني من تسمم الحمل الخفيف مقسمة إلى مجموعتين مجموعة تجريبية ومجموعة ضابطة باستخدام ثلاث أدوات لجمع البيانات. اتبعت المجموعة التجريبية إرشادات تغيير نمط الحياة بالإضافة إلى البروتوكول الدوائي بينما المجموعة الضابطة اتبعت البرتوكول الدوائي فقط. وقد أسفرت النتائج على وجود فروق ذات دلالة إحصائية فى تحسن تسمم الحمل الخفيف والمضاعفات الناتجة عنه بين المجموعتين لصالح المجموعة التجريبية. وتوصي هذه الدراسة باستخدام إرشادات تغيير نمط الحياة بالإضافة إلى البرتوكول الدوائي لتحسين تسمم الحمل الخفيف والمضاعفات الناتجة عنه.

الكلمات المرشدة: نمط الحياة ، تسمم الحمل