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Effect of Self Independence Physical Stretching Exercise on Feto-maternal Outcomes among Mild Preeclamptic Pregnant Women

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Abstract: **Preeclampsia can cause life threatening problems during childbirth. Recently, physical stretching exercise is recommended in pregnant women with preeclampsia to reduce the developing complication. Aim: This study aimed to evaluate the effect of self-independent physical stretching exercise on Feto-maternal Outcomes among Mild Preeclamptic Pregnant Women. Design: Quasi-experimental prospective study research design was utilized. Setting: The present study conducted in antenatal clinic as well as labor units at Benha University Hospital in Benha city, Egypt. Sample: Purposive sample composed of 140 pre-eclamptic women at 28 weeks of gestation and age up to 30 years were included in this study. Tools: Data were collected through three tools I: Structured interviewing questionnaire: to assess socio-demographic characteristics and obstetric history of pregnant women. II: Antenatal follow up sheet: for clinical assessment of blood pressure, self-reported practices after performing physical stretching exercise. III: Maternal and Fetal Outcome Record: To assess maternal complication and fetal outcome. Results: the study revealed that there was high statistically significance decrease of study group`s systolic and diastolic blood pressure throughout follow up visits at p-value was 0.000, there was progressive improvements in all items of self-reported practices sheet as in the 6th follow up visit, after practicing physical stretching exercise and also that there were highly statistical differences in the study & control group after delivery in all items of fetal assessment tool. Conclusion: The present study concluded that practicing self-independent physical stretching exercises are effective, easier and safer for mild pre-eclamptic women. Recommendations: Involvement of physical stretching exercise programs in routine prenatal care for pre-eclamptic women to be provided by specialized health care provider.**

Keywords: **Self Independence Physical stretching exercise, Feto-maternal Outcomes, Mild Pre-eclamptic Women.**

1. INTRODUCTION

Pregnancy is often a stressful period with various physiological, biochemical and anatomical changes in the body. Sometimes these physiological changes cause pathological conditions, problems and diseases for the pregnant women [1]**.** Preeclampsia (PE) is one of the leading causes of maternal and perinatal morbidity and mortality worldwide, unless undetected early as it can lead to eclampsia which is severe and one of the top five direct causes of maternal and infant worse outcomes. Preeclampsia is a specific hypertensive disorder occurs during pregnancy, it accounts for 22% of maternal deaths, 18% of all premature births and increases maternal risks for future cardiovascular disease [2]**.**

Mild preeclampsia is a disorder of vascular endothelial malfunction and vasospasm. It is the presence of a systolic blood pressure (SBP) range from greater than or equal 140 mm Hg.to 160mm Hg. and a diastolic blood pressure (DBP) greater than or equal 90 mm Hg to 110mm Hg, on two occasions at least 4 hours apart in a previously normotensive women. In addition to the blood pressure criteria, proteinuria of greater than or equal to 0.3 grams in a 24-hour urine specimen, or a urine dipstick protein of 1+ (if a quantitative measurement is unavailable) is required to diagnose preeclampsia [3]**.**

Preeclampsia (PE) usually occurs after 20 weeks' of gestation and associated with worse outcomes, women who have preeclampsia are at increased risk of heart disease and stroke later in life [3]**.** Additionally PE can cause life threatening problems during childbirth such as stroke, premature birth or low birth weight. Also pre-eclampsia are the risk factors for future metabolic syndromes, insulin resistance, and cardiovascular diseases [4]**.** Antihypertensive agents seem to have no effect on pregnancy outcome when used for preeclampsia treatment but several studies limited the use of these drugs during pregnancy due to the complications that may be developed such as fetal intrauterine growth restriction, fetal and neonatal bradycardia, and rare cases of thrombocytopenia [5]**.**

One potentially changeable risk factor is physical activity. Women who engaged in moderate to vigorous physical stretching activities before and during pregnancy experienced up to a 35% reduction in preeclampsia. As evidence shows that exercise during pregnancy is one of the most effective ways to reduce the adverse effects of pregnancy such as excessive weight gain and hypertension. Walking is the preferred exercise for most women because it is easy to perform but stretching exercise as physical activity could be done easier than walking, therefore women adherence to physical stretching activity exercises increase muscle flexibility that was measured in previous studies and could reduce the most common complaints such as back pain after childbirth[6]**.**

Regular physical stretching exercise by mild preeclamptic women is associated with beneficial effects on BP, neurohumoral release and autonomic activity. However, among the antihypertensive mechanisms of exercise that remains uncertain are the increased vascular bed, increased sensitivity of the baroreceptors, increased formation and action of antioxidants and also the modulation of sympathetic and parasympathetic tone [7]**.**

Recently; physical stretching activity is recommended in pregnant women with preeclampsia to reduce the deleterious effects of hypertensive disorders in pregnancy and reduction of the incidence of PE or developing of its complications [8]. Stretching exercise as physical activity could be easier therefore, women were more adherences to this activity [9]. In addition, stretching exercise decrease maternal concentration of oxidative substances stress, stimulate placental growth, and act on the reversal of endothelial dysfunction [10].

El- Moselhy et al,(2011) recommend that proper antenatal care program for pregnant women should be improved in Egypt and large number of women in different areas must understand the epidemiology of preeclampsia and methods of primary prevention which requires carful antenatal care on appropriate periods, especially in women who at risk to PE[11]**.**

Nurses were considered the warning alarm of any signs of preeclampsia occurs through routine antenatal visits and should be aware of benefits of life style modifications and possible modalities of care such as prenatal stretching exercises which have positive effects on reducing stress and lowering blood pressure. The women who daily perform prenatal stretching exercises experienced a significantly lower incidence of preeclampsia than expected. Also, nurses should provide continuous, prompt and supportive care to pre-eclamptic women throughout pregnancies as well as after childbirth for safe motherhood [7]**.**

1.1 Significance of the study:

Preeclampsia is a disorder of widespread vascular endothelial malfunction and vasospasm that occurs after 20 weeks' gestation. It accounts for 22% of maternal deaths, 18% of all pre-mature birth worldwide. Unfortunately; in Egypt the prevalence of preeclampsia in a community based a study reported 10.7%, while 12.5% based on hospital studies [3] while Preeclampsia and eclampsia together affect about 10% of all pregnant women around the world [12].

Recently, recommendations about exercise in pregnant women with hypertension or at risk of pre-eclampsia (PE) development have been studied with the objective of trying to reduce the deleterious effects of hypertensive disorders in pregnancy as severe morbidity, long-term disability and death among both maternal and fetal including the reduction of the incidence of PE. Evidence shows that exercise during pregnancy, even for women who have been sedentary before pregnancy, has beneficial effects. In addition, physical stretching exercise is considered a safe activity for both, mother and the fetus, especially when performed under professional guidance and supervision**.** Following an active exercise plan is good if the pregnant woman is truly able to do it. For some who already have a risk of preeclampsia, stretching might be a better option [13]**.**

There is a lack of knowledge in our country about whether physical stretching exercise might improve the risks of preeclampsia and there limited studies regarding examining this topic so we conducted our study after various consultations of obstetric & gynecological professors to proceed the present study to evaluate the effect of self-independence physical stretching exercise on feto-maternal outcomes among mild preeclamptic pregnant women.

1.2 Aim of the study:

This study aimed to evaluate the effect of self-independence physical stretching exercise on feto-maternal outcomes among mild pre-eclamptic pregnant women

1.3 Hypotheses of the study:

Pregnant women with mild preeclampsia who are practicing self-independent physical stretching exercise will have better fetomaternal outcomes compared to control group.

II. SUBJECTS AND METHODS

2.1 Study design:

Quasi -experimental (study/control) prospective study research design.

2.2 Study setting:

The study was conducted in antenatal clinic as well as labor units (to follow feto-maternal outcomes) at Benha University Hospital in Benha city, Egypt.

2.3 Sampling:

2.3 .1 Type: A purposive sample.

2.3 .2 Size: A total of 140 pregnant women was recruited to participate in this study.

2.3 .3 Sample size calculations:

The sample size was calculated based on the previous year census report of admission [14] utilizing the following formula [15]:

$$n=\frac{N}{1+N(e)^2}$$

(Where: n= sample size N= total population (350) e= margin error "0.05")

The total number of subjects comprised (140) mild preeclampic women attending the study settings according to the following:

Inclusion Criteria:

1- Pregnant at 28 weeks of gestation.

2- Age up to 30 years.

3- Singleton pregnancy and Cephalic presentation.

4- Educated women.

Exclusion Criteria:

1- Women have history of preeclampsia in the previous pregnancy

2- Women with multiple pregnancies, cervical insufficiency, vaginal bleeding, heart disease, kidney failure, and neurologic disorders.

2.3 .4 Sample techniques:

Firstly; studied women were chosen according to inclusion criteria.

Secondly; eligible pregnant women were identified and divided into the study group (practice self-independence stretching exercise) and the control group (don't practice stretching exercise).

Thirdly; participants of the study group (n = 70 women) were allocated into seven subgroups. Each formed of 10 participants sharing same due month of delivery to be joined in future antenatal visits and the control group (n = 70 women) followed the routine hospital care.

2.4 Tools of data collection:

2.4.1 Structured Interviewing Questionnaire (SIQ):

It was developed by the researchers. It includes two parts:

Part 1: General characteristics data was collected from all participants women. The characteristics included age, residence, educational level, occupation, family income, body mass index (BMI) telephone number, etc**.**

Part 2: Obstetric history which included number of pregnancies, number of parity, and complications during last pregnancy, labour and postpartum. It also includes present pregnancy assessment which includes gestational age, start of antenatal care and base line data of fetal movement, hemoglobin level, and minor discomforts occurred and activity habits during the past month.

2.4.2 Antenatal follow up record : Which included two parts:

Part 1: Clinical assessment of blood pressure, proteinuria and edema for both groups study and control.

Part 2: self-reported practices after performing physical stretching exercise regarding intensity, frequency, duration, advantages and presence of complications

-It collected during antenatal follow up visits contained 6visits for each preeclamptic woman starting at 28 weeks then monthly till 36 weeks and every week till time of delivery and lastly one week during the post-partum period.

2.4.3 Maternal and Fetal Outcome Record: which include

-Maternal assessment record for complications during pregnancy, labor (type of delivery, reason for cesarean) and post-partum

- Fetal assessment record for gestational age, infant sex, apgar score, newborn condition, birth weight, birth defect and neonatal complications.

2.4.4 A supportive materials include compact disc and Handout containing stretching exercise technique: Stretching exercises were copied on a compact disc and printed in hand out and distributed to the study group with stretching exercises in order to watch these exercises or read it in hand out clear by colored figures which keep them easy to implement it step by step at home. These simple exercises were warm-up, stretching (1. stretch the Back to correct the curvature, 2. Unilateral neck was stretching, 3. Neck rotating, 4. Up and down movement of the head, 5. The chin is moving upward with stretch, 6. The chest was Stretching with the hands crossing over the chest, 7. Hand and arm were stretching, 8. Unilateral stretch of the body while seated) and cooling down (including relaxation and breathing exercises).

2.5 Tools validity:

Content validity was done by a panel of seven experts in the field of Maternity Nursing, Obstetric Medicine and Physiotherapists to assure content validity. The questionnaire modified according to the panel judgment on clarity of sentences and appropriateness of content.

2.6 Tools reliability:

The reliability of the tool was measured by the Cronbach's alpha which was 0.78 for a tool (1) while in a tool (2) was 0.72 which indicate a good internal consistency of an instrument.

2.7 Ethical considerations:

Each woman was informed about the purpose and benefits of the study at the beginning of the study. An oral consent was obtained from each woman before starting the data collection. Confidentiality was ensured throughout the study process. Each studied woman was informed that, participation is voluntary and each one had a choice to continue or withdraw from the study.

2.8 Approval:

An official approval to conduct this study was obtained from Dean of Faculty of Nursing to Director of the University Hospital, then the researchers obtained the permission from the consultant doctors to proceed with the proposed study to mild pre eclamptic women and finally the researchers were interviewed each study participant and were obtained an informed consent before starting the data collection.

2.9 Pilot Study

The pilot study carried out on 10% of total sample to evaluate efficiency and clarity of tools, no modifications were done then women involved in the pilot study were included in the main sample.

2.10 Procedure:

The study was carried out from beginning of December 2018 to the end of June 2019, covering a period of seven months. An official approval to conduct this study was obtained from the Dean of Faculty of Nursing to Director of Benha University Hospital. The researcher visited the previously mentioned setting twice/week (Saturday and Monday) from 9.00 a.m. to 1.00 p.m.

A-**The exercise group:**

The study was achieved through the following steps:

1- Before interviewing the study group, the researchers trained themselves (assisted by a physiotherapist) to practice standardized physical stretching to learn the women during interview.

2- Once permission was obtained, the researchers interview the participants who fulfilled the inclusion criteria six times (1st time at 28week of gestation, 2nd at 32week, 3rd at 36week, 4th at 37 week, 5th at 38 week and 6th time was conducted one week after delivery) to complete the basic data, using a structured Interviewing questionnaire and Antenatal follow up tool **(tool I, II)**.

3- During the first time: The purpose and nature of the study were explained. The blood pressure was measured, investigation of protein urea is made, and clinical examination of edema is done and recorded by the researchers. Demonstration about the importance and technique of different types of stretching physical exercise was explained via a compact disc containing video about stretching exercise technique. These take about 30-45 minutes. Finally, mild pre-eclamptic women re-demonstrate the physical stretching exercise.

4- The researchers well trained the participants about how to perform the self-independence stretching exercise, and then asked them to perform the exercise four to five times /week for 3months till the end of pregnancy. The mild preeclampsia women instructed, whenever feel the need to stretch hold each stretch to a point of mild tension for about eight to 10 seconds then releases. Each time stretch; go a little further, as long as woman comfortable and there is no pain.

5-the compact disc and handout distributed after finishing the session to be practiced at home ,due to the lack of space area in the Obstetric Department so one session taken at hospital and the pregnant women were instructed to perform minimum of three and a maximum of five sessions at home for 20 to 30 minutes to every session. The exercises warnings signs and necessary precautions were provided for the participants on a compact disc and handout also .The participants visited the Obstetric Department 1 day a week and their blood pressure was measured before the exercise and 15 min after the exercise.

5- The women asked to stop practice if, they had any of the following symptoms: shortness of breath, palpitations, dizziness, headache, nausea, severe or sudden abdominal pain, chest pain, back pain, pain in pubic area, vaginal bleeding, and reduced fetal movements after practicing stretching exercise. The participants were followed up monthly in the outpatient clinic for 3 months (from 28 weeks of gestation till one week after delivery to ensure women compliance with interventions given.

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6- Effectiveness of practiced exercise was evaluated by fetomaternal outcomes after delivery in 6thtime using maternal and neonatal records (fetomaternal outcome) **(tool III)**.

B-The control group:

The control group given a routine antenatal care and assessed at the same time of study group and then data were analyzed using SPSS for comparison between two groups regarding feto-maternal outcomes to explore effect of stretching exercises on the study group.

2.11 Limitations of the Study:

No specific limitation meet researchers while implementing the study, but there was Challenging to facilitate group place and sessions by lack of space area in the Obstetric department so one session taken at hospital and the pregnant women were instructed to perform minimum of three and a maximum of five sessions at home for 20 to 30 minutes to every session and given a compact disc and handouts explaining technique and what every woman want to know about these exercise.

Data analysis:

Data was verified prior to computerized entry. The statistical package for social sciences (SPSS version 20) was used for that purpose, followed by a data tabulation and analysis. Quantitative data were described using minimum and maximum, mean and standard deviation. Test of significance (Chi-square, Fisher exact test, Independent test , and ANOVA test) Pearson correlation coefficients were used .A significant level value was considered when $P \leq 0.05$, and a highly significant level value was considered when $P < 0.001$.

III. RESULTS

Table (1): Distribution of studied women regarding their Socio-Demographic Characteristics (n= 140).

Item	Study		Control		X^2	p-value
	No. (70)	%	No. (70)	%		
Age:						
<20 years	16	22.8	26	37.1	16.2	0.070
20-30 years	34	48.6	21	30.0		
More than 30 years	20	28.6	23	32.9		
X-±SD	26.9±6.37		25.7±7.21			
Residence						
Rural	41	58.6	36	51.4	1.40	0.23
Urban	29	41.4	34	48.6		
Level of education						
Primary education	4	5.7	10	14.3	7.80	0.02
preparatory education	37	52.9	45	64.3		
higher education	29	41.4	15	21.4		
Occupation						
house wife	42	60.0	41	58.6	0.03	0.86
Worked	28	40.0	29	41.4		
family income						
≥ 2000	27	38.6	33	47.1	1.05	0.30
<2000	43	61.4	37	52.9		
BMI						
Under weight	10	14.3	2	2.9	10.9	0. 10
Normal weight	16	22.9	11	15.7		
Over weight	30	42.9	29	41.4		
Obese I	14	20.0	28	40.0		

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As regards to socio-demographic characteristics of the studied women, table (1) shows no statistical differences between two groups. (52.9%) of the study group had preparatory education and (58.6 %) of them were from rural areas compared to (64.3%) of the control group had preparatory education and (51.4%) of them from rural areas, near two- thirds of both groups were house wife. With respect to family income, about two thirds of both groups have family income less than 2000 pound. Concerning BMI categories, more than two -fifth of both groups were in over weight. In addition 20% of the study group and 40% of the controls were obese class I.

Table (2): Distribution of studied women regarding their past obstetric history (no= 140).

Item	Study		Control		X^2	p-value
	No. (70)	%	No. (70)	%		
No of gravidity						
<3	34	48.6	35	50.0	0.02	0.86
>3	36	51.4	37	52.9		
No of parity						
<3	32	45.7	26	37.1	7.42	0.06
>3	38	54.3	44	62.9		
Complications in last pregnancy, labor and postpartum					4.30	0.03*
Yes	25	35.7	14	20.0		
No	45	64.3	56	80.0		

Table (2) reveals that no statistical differences between study and control group. Regarding gravidity and parity more than half of study and control group had more than three of them. (64.3 %) & (80%) of didn`t have complications in last pregnancy, labor and postpartum in both groups respectively.

Table (3): Distribution of studied women regarding their present pregnancy history (pre intervention) (no= 140) .

Item	Study		Control		X^2	p-value
	No. (70)	%	No. (70)	%		
fetal movement						
Good	52	74.3	50	71.4	0.86	0.35
Poor	18	25.7	23	32.9		
Hemoglobin (HB)					4.11	0.04*
Normal	66	94.3	70	100.0		
Mild Anemic	4	5.7	0	0.0		
Minor discomfort of present pregnancy:					2.02	0.15
Yes	70	100.0	68	97.1		
No	0	0.0	2	2.9		
Perform regular exercise or activities during the past month						
Yes	10	14.3	7	10.0	7.98	0.43
No	60	85.7	63	90.0		
Start of Antenatal care						
After 3 months	20	28.6	34	48.6	5.90	0.51
Before 3 months	50	71.4	36	51.4		

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Table (3) demonstrates that (74.3%) and (71.4%) of the study and control groups felt good fetal movement, (100.0%) & (94.3%) of both control and study group had normal hemoglobin. Also, (85.7%) & (90.0%) of both study and control group didn`t perform regular exercise during the past month.

Table (4): Mean and standard deviation of blood pressure between study and control groups during antenatal follow up visits (no.= 140).

Items	Study		Control		T	p-value
	Mean	±SD	Mean	±SD		
1st visit						
Systolic	151.93	±6.72	145.60	6.64	5.60	0.73 ns
Diastolic	99.32	±5.52	96.40	4.99	3.29	0.57 ns
2nd visit						
Systolic	150.17	±7.31	164.42	10.99	9.03	0.000 **
Diastolic	97.57	±4.66	111.79	12.21	9.09	0.000**
3rd visit						
Systolic	146.10	± 6.73	162.86	11.56	10.47	0.000**
Diastolic	94.64	±4.17	108.14	9.33	11.04	0.000**
4th visit						
Systolic	143.99	±6.55	161.61	9.06	13.18	0.000**
Diastolic	92.67	±3.98	108.64	8.92	13.67	0.000**
5th visit						
Systolic	141.74	±6.11	166.00	17.56	10.91	0.000**
Diastolic	90.60	±3.08	108.11	14.56	9.84	0.000**
6th visit						
Systolic	138.46	±6.15	167.61	21.57	10.87	0.000**
Diastolic	89.07	±2.911	112.64	18.39	10.59	0.000**

ns no statistically significant difference ($p > 0.05$) ** A highly statistically significant difference ($P \leq 0.001$) Table (4) shows highly statistical significance between two groups in follow up visits as p-value was 0.000 with highly significance decrease of systolic and diastolic blood pressure throughout follow up visits in study group.

Table (5): Distribution of the studied women regarding presence of protein urea, edema and symptoms of preeclampsia throughout antenatal follow up visits (no.= 140).

Visits	Protein urea				Edema				preeclamptic symptoms				X2	p-value
	Study		Control		Study		Control		Study		Control			
	No	%	No	%	No	%	No	%	No	%	No	%		
1st	55	78.6	56	80.0	37	52.9	33	47.1	66	94.3	33	47.1	5.60	<0.001**
2nd	49	70.0	64	91.4	37	52.9	33	47.1	64	91.4	32	45.7	3.29	< 0.05*
3rd	32	45.7	57	81.4	30	42.9	34	48.6	30	42.9	34	48.6	9.84	<0.001**
4th	32	45.7	55	78.6	29	41.4	37	52.9	29	41.4	38	54.3	9.09	<0.001**
5th	32	45.7	48	68.6	29	41.4	38	54.3	14	20.0	37	52.9	7.56	<0.001**
6th	29	41.4	41	58.6	27	38.6	41	58.6	16	22.9	41	58.6	10.04	<0.001**

*A statistically significant difference ($P \leq 0.05$) ** A highly statistically significant difference ($P \leq 0.001$).

Table (5) reveals there was highly statistical significance between the study and control groups regarding the presence of protein urea, edema and symptoms of preeclampsia in 1st,3rd_,4th_,5th_,and 6th_ visit of follow up after practicing physical stretching exercise as p-value < 0.001.

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Table (6): Distribution of the study group regarding follow up after exercise (self-reported practices) (no.= 70).

Item	1st visit		2nd visit		3rd visit		4th visit		5th visit		6th visit	
	No	%	No	%	No	%	No	%	No	%	No	%
Intensity of exercise												
Mild	70	100.0	62	88.6	33	47.1	20	28.6	25	35.7	25	35.7
Moderate	0	0.0	8	11.4	37	52.9	50	71.4	45	64.3	45	64.3
frequency (times/week)												
1-2	42	60.0	27	38.6	8	11.4	0	0.0	14	20.0	23	32.9
2-4	28	40.0	37	52.9	59	84.3	55	78.6	52	74.3	44	62.9
4+	0	0.0	6	8.6	3	4.3	15	21.4	4	5.7	3	4.3
Duration (minutes/day)												
<20	39	55.7	36	51.4	10	14.3	12	17.1	40	57.1	32	45.7
20-30	31	44.3	34	48.6	60	85.7	58	82.9	30	42.9	38	54.3
Advantage of exercise												
Feeling active & feeling energy	11	15.7	22	31.4	15	21.4	6	8.6	0	0.0	25	35.7
Feeling relax &adjusting mood	15	21.4	15	21.4	3	4.3	14	20.0	0	0.0	45	64.3
Easier to perform ADL	9	12.9	17	24.3	6	8.6	8	11.4	14	20.0	22	31.4
Reduced minor discomfort of pregnancy	13	18.6	16	22.9	15	21.4	11	15.7	40	57.1	50	71.4
All of the above	22	31.4	0	0.0	31	44.3	39	55.7	6	8.6	0	0.0
presence of complication												
No	40	57.1	63	90.0	70	100.0	62	88.6	56	80.0	47	67.2
Decreased fetal movement	15	21.4	7	10.0	0	0.0	0	0.0	0	0.0	0	0.0
Slight shortness of breath	0.0	0	0.0	0.0	0	0.0	0	0.0	14	20.0	23	32.9

Table (6) shows progressive improvements in all self-reported practices as in the 6th follow up visit after practicing physical stretching exercise ,there were about two thirds of the studygroup perform moderate stretching exercise (64.3%) with frequency from 2-4 times/week, besides more than the half perform exercise for up to 20-30 minutes/day ,more than two thirds feeling relax &adjusting mood after exercise and more than two thirds hadn't any complication after performing stretching exercise .

Table (7): Distribution of studied women regarding maternal outcomes (no=140)

Item	Study		Control		X^2	p-value
	No	%	No	%		
Complications in present pregnancy						
No	46	65.7	5	7.1	27.5	0.000**
Moderate preeclampsia	19	27.2	24	34.3		
sever preeclampsia	5	7.1	22	31.4		
Antepartum hemorrhage	0	0.0	19	27.2		
Complications in present delivery						
No	51	72.8	14	20	19.6	0.000**
Intrapartum bleeding	0	0.0	6	8.6		
Signs of Maternal distress	10	14.3	35	50.0		
Signs of fetal distress	9	12.9	15	21.4		
Complications in present postpartum						

No	61	87.1	19	27.1	15.7	0.003**
Postpartum bleeding	9	12.9	13	18.6		
Postpartum preeclampsia	0	0.0	38	54.3		
Mode of delivery						
Vaginal delivery	24	34.2	20	28.6	33.2	0.62 ns
cesarean section	46	65.8	50	71.4		
Reason for C.S						
Repeat C-sections	37	80.4	35	70.0	11.2	0.03*
Fetal distress	9	19.6	15	30.0		

ns no statistically significant difference (p > 0.05) *A statistically significant difference (P ≤ 0.05) ** A highly statistically significant difference (P ≤ 0.001).

Table (7) shows there were highly statistical significant decrease in frequency of complication presented in pregnancy, and delivery between the study and control groups as p-value 0.000 ,there were statistical significant decrease in the complications presented in postpartum as p-value <0.05 . Regarding mode of delivery, more than the half of the study and control group delivered cesarean section and the majority of both groups reported the reason of C.S due to repeat C-sections.

Table (8): Distribution of studied women regarding their fetal-outcomes (no= 140).

Item	Study		Control		X^2	p-value
	no	%	No	%		
birth weight						
Normal	48	68.6	29	41.4	20.3	0.000**
Abnormal	22	31.4	41	58.6		
Apgar score AT 1st min						
Poor	30	42.8	56	80.0	82.7	0.000**
Good	40	57.2	14	20.0		
Apgar score AT 5th min						
Poor	16	22.9	45	64.3	85.1	0.000**
Good	54	77.1	25	35.7		
Newborn condition						
Live	54	77.1	2	2.8	75.1	0.000**
Incubator	15	21.5	48	68.6		
Dead	1	1.4	20	28.6		
Neonatal complications						
Respiratory distress	7	36.8	40	57.4	20.3	0.000**
Diabetes	3	4.2	9	12.9		

** A highly statistically significant difference (P ≤ 0.001).

Table (8) demonstrates that there was highly statistical differences between study &control group regarding fetal outcomes of birth weight , Apgar score AT 1st min , and AT 5th min, Newborn condition and Neonatal complications as p-value < 0.001.

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IV. DISCUSSION

Mild Preeclampsia is a common hypertensive disorder of pregnancy that is associated with short-term and long-term morbidity and mortality [15]. Eventually, the current study aimed to evaluate the effect of self- independence physical stretching exercise on feto-maternal outcomes among mild preeclamptic pregnant women.

Regarding socio demographic characteristics, the current study clarified that the mean ± SD of the study group age were (26.9±6.37) years, while the control group were (25.7±7.21) years, these results are similar to a study on "Association of biochemical markers with the severity of pre-eclampsia" conducted at the outpatient clinic at Kasr AlAiny Hospital in Cairo, Egypt, and found that the age of the study group was 26.2±4.4 and the age of the control group was 25.4±4.7 0.132 [16].This could be justified as this age constitutes the normal reproductive age for pregnancy and childbirth.

Furthermore, the current study documented that more than half of both groups had preparatory education and about two thirds of both groups have family income less than 2000 pound. These findings disagreed to results of [11] who documented that about one third of the preeclamptic study cases were preparatory education and less than half were low income.

Concerning Body Mass Index (BMI), the current findings revealed more than two - fifth of both studied groups were in over weight category.

This result was in congruence with [17] who found that the BMI of the preeclamptic group was 28.99±6.1 which in category over weight and added there was a positive association between pre-pregnancy BMI and risk of preeclampsia. This finding also similar with [18] who demonstrated that increased weight was more associated with developing the mild preeclampsia. Furthermore, [16] reported that BMI of mild preeclamptic group was 31.8±2.9 and categorized as obese class I .

This may be leading to development of preeclampsia that deteriorate status of pregnant mother &increase maternal mortality rate. Recent studies have suggested that increased body mass index and weight gain during pregnancy are important risk factors for hypertensive disorders in pregnancy. Studies have shown that the risk of these disorders increases with obesity, being overweight before pregnancy, and excessive weight gain during pregnancy [19].

Regarding blood pressure, the findings of the current study documented highly statistical significance between two groups in follow up visits as p-value was 0.000 with highly significance decrease of systolic and diastolic blood pressure throughout follow up visits in the study group. These results were in the same line with [20] in a study on the effects of walking and stretching exercises on the risks of preeclampsia and denoted that Systolic blood pressure had significantly increased in the walking group ($P < 0.01$), while for the stretching group, there was significantly decreased .

Also, the results of the current study were in accordance with [21] which aimed to investigate the effect of stretching exercise and walking on preeclamptic women blood pressure during pregnancy and found reducing systolic and diastolic blood pressure in the second and third trimester of pregnancy in both groups while no change in control group .

[22] Demonstrated the relationship between physical activity and hypertensive disorders in pregnancy and concluded that physical stretching exercise during pregnancy can reduce the risk of hypertensive disorders and preeclampsia as the preeclamptic women when performing physical stretching exercise their blood pressure levels and cardiovascular fitness were improved.

Our opinions for such agreement between our finding and other studies finding may be attributed to stretching exercises had better effect on reducing blood pressure during pregnancy. Physical Stretching exercise could provide protection against preeclampsia because stretchers produced more transferring, which is a plasma protein that transports iron through the blood and protects against oxidative stress on the body [21]. Recently, a large number of women, according to the recommendations of the American Board of Obstetrics and Gynecologists and other organizations, engaged in exercise during pregnancy. [23]

More over the present study reveals that there was highly statistical significance between the study and control groups regarding the presence of protein urea, edema and symptoms of preeclampsia in 1st,3rd_,4th_,5th_,and 6th_ visit of follow up after practicing physical stretching exercise as p-value < 0.001.These results agreed with [24]who found

progressive decrease in preeclampsia clinical features as proteinurea and odema after performing yoga which contains stretching because there was a lowering of oxidative stress which associated which aggravating preeclampsia features. This similarity with our findings considers a predictable conclusion after these progressive lowering of systolic and diastolic blood pressures throughout the follow up visits and a positive indicator to favorable physiological cardiac effects.

The current findings showed progressive improvements in all self-reported practices as in the 6th follow up visit after practicing physical stretching exercise ,there were about two- thirds of the study group perform moderate stretching exercise with frequency from 2-4 times/week, besides more than the half perform exercise for up to 20-30 minutes/day ,more than two- thirds feeling relax &adjusting mood after exercise and more than two thirds hadn't any complication after performing stretching exercise. These results supported by [22] who showed that continuous performing stretching exercises increase muscle flexibility that was measured in a previous study, and could decrease blood pressure during pregnancy, and additionally reduced the most common complaints such as back pain after childbirth.

Our opinions for such agreement between our finding and other studies finding may be related to simplicity of exercise and proper media used; which reflects that on pre-eclamptic women practice after education and training. As they found that physical stretching exercise easier to perform and promoting their health during pregnancy.

The current work revealed that there were highly statistical significant decrease in the complication presented in pregnancy and delivery of the study group compared to control groups as p-value < 0.001 and also there were statistical significant decrease in the complications presented in postpartum period of the study group compared to control groups as p-value <0.05 . These results are in congruence with the findings of .[25]who conducted the study in antenatal as well as and labor units at El-Shatby Maternity University Hospital in Alexandria on 64 pregnant women to investigate the impact of physical stretching exercise on Feto-maternal outcomes of preeclamptic women and found that three quarters of the study subjects didn`t develop complication after performing stretching exercise program. Such agreement between our finding and other studies finding may be related to the stretching exercises had better effect on reducing complications associated with preeclampsia during pregnancy due to improve maternal circulation that leads to increase fetal`s blood supply.

The present study clarified that more than two thirds of the study and control groups` mode of delivery were cesarean section with no significant difference between both groups as p-value > 0.05. This result was to agree with .[26]who stated in a cohort study of maternal outcomes according to mode of delivery in women with preeclampsia that previous studies had shown that caesarean delivery was chosen because of inadequate fetal monitoring equipment and lack of fetal scalp sampling in the hospital where the study was conducted for patients in labour which associated with higher rate of preeclampsia complications. Also, this result was agreed with. [25] Who documented physical exercise under professional supervision does not seem to interfere in the type of delivery or maternal and neonatal outcomes.

This increase in caesarean section rate in the present study was due to repeated cesarean section for the reason that the doctors were anxious about potential complications occur during vaginal delivery either due to uncontrollable blood pressure or due to lack of monitoring facilities during delivery and consider the cesarean section is more safe for such mothers and their fetuses.

On the other hand the current study reported improvement in fetal out comes in the study group after performing physical stretching exercise compared to control group as presented as there were highly statistical significant in all items of fetal assessment tool of the study group compared to control group after delivery such as birth weight , Apgar score at 1st min , Apgar score and at 5th min, newborn condition and neonatal complications as p-value < 0.001.

These findings are supported by [27] who evaluate the association between physical exercise supervised in pregnant women with chronic hypertension and/or previous preeclampsia and maternal and neonatal outcomes and concluded that Physical exercise under professional supervision, did not produce maternal and neonatal risks of the occurrence of morbidity

Also, the present study findings came with the same line with [24] who reported that there were significant differences in variables regarding to neonatal outcomes as most of the subjects who performing exercise not suffer from neonatal complications.

While the present findings contradict with [22] who evaluated the delivery outcome of two groups of preclamptic women, one performed stretching exercise and other didn`t in late pregnancy and observed no difference in newborn weight and apgar score ,and additionally rationale this observation by women who started physical stretching exercise earlier in pregnancy have improvements in placental growth and maternal circulation than those start in late pregnancy so the fetal outcomes were improved.

Our results of the current study have been proved that performing physical stretching exercise report more improvements of mild pre-eclamptic women health and reduced potential complications that might worsening maternal and fetal outcomes. This finding supported by [28] recommendations as the physical stretching exercise is safe for pregnant women with maternal complications or medical problems and it is indicated to exercise at least 30 minutes per day.

Finally, the above findings of the current study supported the hypothesis that the pregnant women with mild preeclampsia who practicing self-independent physical stretching exercise will have better feto-maternal outcomes compared to controls.

V. CONCLUSION

Based on the findings of the present study, the current study concluded that practicing self-independent physical stretching exercises are easier and safer for mild pre-eclamptic women with better feto-maternal outcomes. There was highly significance decrease of a systolic and diastolic blood pressure throughout follow up visits in the study group. Progressive improvements in all self-reported practices as in the 6th follow up visit after practicing physical stretching exercise , more than two- thirds feeling relax &adjusting mood after exercise and more than two- thirds hadn't any complication after performing stretching exercise which reflect better maternal outcomes . highly statistical differences between study &control group regarding fetal outcomes of birth weight , Apgar score , newborn condition and neonatal complications as p-value < 0.001 which reflect better fetal outcomes , these results proved that hypothesis was supported

VI. RECOMMENDATIONS

Based on the findings of the current study, the following recommendations can be suggested:

1- Involvement of physical stretching exercise programs in routine prenatal care to be provided by specialized health care provider.

2- Nurses' guidelines about technique and precautions of physical stretching exercise for pregnant women with simple preeclampsia play a key role in early control of pregnancy-induced complications.

Further researches:

1- Highlight the importance of performing physical stretching exercise for positive pregnancy outcomes in high risk groups.

2- Studying the effect of lifestyle alteration of pregnant women with mild preeclampsia on maternal and fetal status

3- Encourage other clinical trials with higher frequency and duration of exercise sessions.

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REFERENCES

[1] Stefani L., Mascherini G. and Galanti G., 2017:Indications to Promote Physical Activity during Pregnancy,J. Funct. Morphol.Kinesiol. 2, 31; doi:10.3390/jfmk2030031 www.mdpi.com/journal/jfmk.

[2] Arulkumaran, N.; Lightstone, L. (December 2013): "Severe pre-eclampsia and hypertensive crises". Best Performing & Research Clinical Obstetrics &Gynaecology 27 (6): 877–884.

[3] American College of Obstetricians and Gynecologists, 2013:Task Force on Hypertension in Pregnancy. Hypertension in pregnancy.Report of the American College of Obstetricians and Gynecologists' Task Force on Hypertension in Pregnancy.Obstet Gynecol. 2013 Nov. 122 (5): 1122-31.

[4] Gold RA, Gold KR, Schilling MF, Modilevsky,2014: Effect of age, parity, and race on the incidence of pregnancy associated hypertension and eclampsia in the United States. Pregnancy Hypertension: An International Journal of Women's Cardiovascular Health 2014;4:46-53.

[5] Lindheimer MD, Taler SJ, Cunningham FG,2009: American Society of Hypertension. ASH Position Paper: Hypertension in Pregnancy. J ClinHypertens 2009;11:214-25.

[6] May L.& Part 3,2012: Special considerations for exercise during pregnancy, ACSM'S Certified News;22:4-5.

[7] Renato R., Carlos P, Gustavo, Cristina D., Eduardo C., 2014: Effect of exercise on the maternal outcome in pregnancy of spontaneously hypertensive, Acta Cirúrgica Brasileira - Vol. 29 (9) – 553.

[8] Souza V. F. F., Dubiela A., and N. F. Serr˜aoJ´unior,(2010): "Efeitos do tratamentofisioterapˆeuticonapr´e-eclampsia," FisioterapiaemMovimento, vol. 23, pp. 663–672.

[9] Nelson AG, Kokkonen J. Champaign, I,2017: Human Kinetic,. Stretching anatomy.

[10] Aune D, Saugstad OD, Henriksen T, Tonstad S.,2014:Physical activity and the risk of preeclampsia a systematic review and meta-analysis. Epidemiology J,;25:331–43.

[11] El-Moselhy E; Khalifa1 H; Amer S; Mohammad K and Abd El-AalH.,2011: Risk Factors and Impacts of Pre-Eclampsia: An Epidemiological Study among Pregnant Mothers in Cairo, Egypt Journal of American Science, 2011; 7(5).

[12] WHO, 2016: WHO Maternal Mortality, Geneva.

[13] Zavorsky G. S. and Longo L. D.,2011: "Exercise guidelines in pregnancy:newperspectives,"SportsMedicine,vol.41, no.5,pp. 345–360.

[14] Benha University Hospital ,2017: medical and statistical records of preeclampsia annual flow rate.

[15] Ahmed R., Dunford J., Mehran R, Robson S., Kunadian V., 2014: Pre-eclampsia and future cardiovascular risk among women: a review,J Am Coll Cardiol. 2014;63:1815–1822. doi:10.1016/j.jacc.2014.02.529.

[16] Maged M. , Aid G. BassiounyN. S. Eldin D, Dahab Sh. Ghamry N., 2016: Association of biochemical markers with the severity ofpre-eclampsia , Int J Gynecol Obstet 136 © 2016 International Federation of Gynecology and Obstetrics,wileyonlinelibrary.com/journal/ijgo ,: 138–144.

[17] Sharami S., Zendehdel M, Mirblouk F, Asgharnia M, Faraji R, 2017:Comparison of Preeclampsia Risk Factors Regarding to Severity withControl Group , Zahedan J Res Med Sci. 2017 January; 19(1):e5008.

[18] Sohlberg S, Stephansson O, Cnattingius S, Wikstrom AK. Maternal, 2012: body mass index, height, and risks of preeclampsia. Am J Hypertens,25(1):120–5. doi: 10.1038/ajh.2011.175. PubMed: 21976280.

[19] Falcao S., Bisotto S., Michel C.,2010: "Exercise training can attenuate preeclampsia-like features in an animal model," Jour- nal of Hypertension, vol. 28, no. 12, pp. 2446–2453, 2010.

[20] Yeo,2009: Adherence to walking or stretching, and risk of preeclampsia in sedentary pregnant women. Research in Nursing & Health. 2009; 32: 379–390.

[21] Bahadoran P, Pouya F, Zolaktaf V, Taebi M. ,2015:The effect of stretching exercise and walking on changes of blood pressure in nulliparous women. Iran J Nurs Midwifery Res. 2015;20:205–210.

[22] Taebi M, Sadat Z, Saberi F, Abedzadeh M.,2015: Early Pregnancy waist to hip ratio and risk of preeclampsia: A prospective cohort study. Hypertension Resaerch;38:80-3.

[23] Garber C.E., Blissmer B., Deschenes MR., Franklin B., Lamonte M., Lee IM, 2011, American College of Sports Medicine position stand. Quantity and quality of exercise for developing and maintaining cardiorespiratory, musculoskeletal, and neuromotor fitness in apparently healthy adults: guidance for prescribing exercise, American College of Sports Medicine. Med Sci Sports Exerc 2011;43:1334–59.

[24] Ahmed S.S.,.Helmy H .K, ,. MohamedA.A,2017:Impact of a Tailored Intensive Educational Program upon Preeclampsia on Nurses' Knowledge at Beni-Suef City, Egypt,International Journal of Nursing Science 2017, 7(4): 79-83.

[25] Yakout S. M.,2016: Impact of Physical Stretching Exercise on Feto-Maternal Outcomes AmongMild Preeclamptic Pregnant Women in Egypt ,American Journal of Nursing Science. Vol. 5, No. 3, 2016, pp. 114-121. doi: 10.11648/j.ajns.,Published: June 14, 2016.

[26] Melania MR, Amorima LK, Barros AS, Almeida TSF, Souzaad ASR, Faúndes A.,2015:Maternal outcomes according to mode of delivery in women with preeclampsia: a cohort study. J Matern Fetal Neonatal Med. 2015;28(6).

[27] Kasawara K.T., Burgos G., Nascimento S., FerreiraS., SuritaF., SilvaJ.,2013: Maternal and Perinatal Outcomes of Exercise inPregnant Women with Chronic Hypertension and/or PreviousPreeclampsia: A Randomized Controlled Trial, ISRN Obstetrics and GynecologyVolume 2013, Article ID 857047, 8 pages, Hindawi Publishing Corporation http://dx.doi.org/10.1155/2013/8570.

[28] The American College of Obstetricians and Gynecologists. Exercise During Pregnancy. Retrieved march 22, 2017. Available from http://www.acog.org/publications/patient_education/bp119.cfm.