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بِسْمِ اللّٰهِ الرَّحْمٰنِ الرَّحِيْمِ



# **EFFECT OF AEROBIC EXERCISES ON PRIMARY DYSMENORRHEA IN OBESE GIRLS**

**تأثير التمارينات الهوائية على آلام الطمث الأولية  
لدى الفتيات البدائيات**

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# *Dedication*

Thanks for Allah ,

my professors ,

my Father & Mother

and special dedication

to my Husband

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# Agenda

- Introduction.
- Purpose of the study.
- Subjects, materials and methods.
- Results.
- Conclusion.
- Recommendations.

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# Introduction



# Dysmenorrhea

Dysmenorrhea means the occurrence of painful cramps during menstruation. It is categorized into two types: **primary and secondary.**

- **Primary** dysmenorrhea is painful menses in women with normal pelvic anatomy, usually beginning during adolescence
- **Secondary** dysmenorrhea is menstrual pain associated with underlying pathology and its onset may be years after menarche .

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# Symptoms

- Symptoms typically last less than three days.
- The pain is usually in the pelvis or lower abdomen and may radiate to the thighs and lower back.
- Other symptoms may include diarrhea, constipation, nausea, vomiting, headache, dizziness and fatigue.

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# Causes

- The release of prostaglandins in the menstrual fluid, which causes uterine contractions and pain.
- Vasopressin increase uterine contractility and causing ischemic pain as a result of vasoconstriction.
- Leukotrienes have been postulated to heighten the sensitivity of pain fibers in the uterus of women with primary dysmenorrhea that does not respond to treatment with prostaglandin antagonists

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# Treatment

## I-Medical treatment:

An analgesic medication, non steroidal anti-inflammatory drugs (NSAIDs) such as (ibuprofen, and naproxen), oral contraceptives and supplementations.

## II-Non medical treatment :

Acupressure, acupuncture, heat therapy, herbal moxibustion, behavioral interventions, spinal manipulation, and transcutaneous electrical nerve stimulation (TENS).

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# Obesity

**Obesity is an excess body fat accumulated to the extent that it may lead to increase health problems.**

**Obesity is caused by a combination of excessive food energy intake, lack of physical activity, and genetic susceptibility, although a few cases are caused by genes, endocrine disorders, medications or psychiatric illness.**

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# **Obesity and dysmenorrhea**

**Obesity is responsible for higher rate of dysmenorrhea among girls.**

**Obese women tend to have higher estrogen levels. It has also been shown that people with higher BMI have higher levels of prostaglandin. Both high estrogen and high prostaglandin are probable mechanisms of dysmenorrhea .**

# **Effect of exercise on dysmenorrhea**

**Performing regular physical activity reduced the primary dysmenorrhea symptoms by:**

- 1. Decreasing blood estrogen concentrations, which decreases the risk of dysmenorrhea.**
- 2. The release of endorphins which are produced by brain, may enhance the pain threshold, and these materials in turn raise the pain threshold of the body.**
- 3. Improving blood flow at the pelvic level as stimulating the release of endorphins, which act as non-specific analgesics.**

# **Effect of exercise on weight lose**

**Exercise training may reduce body weight By:**

1. Increasing metabolic rate and fat catabolism. This results in a reduction of basal triglyceride levels and loss of fat mass
2. Improving the lipid enzyme profile which in turn, can result in modest reduction in low-density lipoprotein (LDL) cholesterol and elevations of high-density lipoprotein (HDL) cholesterol.
3. Improving insulin sensitivity and blood glucose tolerance.
4. With use, muscles consume energy derived from both fat and glycogen. So, exercise reduce body fat .

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## Purpose of the study

To investigate the effect of the aerobic exercises for relieving primary dysmenorrhea in obese girls.

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# **SUBJECTS, MATERIALS AND METHODS**



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# SUBJECTS

This study was carried on 30 obese girls having regular menstrual cycles with primary dysmenorrhea. They were selected randomly from Menouf Hospital.

Their ages were ranged from 18-25 years old, their BMI was  $>30$ - $<34.9 \text{ kg/m}^2$  and waist/hip ratio  $>0.80$ .

They were randomly divided into two equal groups in numbers:

1. **Group(A):** Participated in a program of aerobic exercises in addition to low caloric diet.
2. **Group (B):** Followed the same low caloric diet as group (A).

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# **variables**

- 1. Body Mass Index**
- 2. Waist Hip Ratio**
- 3. Estrogen hormone level**
- 4. Pain intensity assessed by Visual analogue scale.**



# Instruments

## ❖ Evaluation instruments:

- Recording Data Sheet.
- Weight-height scale.
- Tape measurement.
- Visual analogue scale (VAS).

## ❖ Treatment instruments:

- Bicycle ergometer.



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# Methods

- **Exercise training program:**

Each girl was participated in an aerobic exercise training program three times per week for 36 sessions. Duration of each session was 45 minutes. They were participated in an aerobic exercise training program from the 1<sup>st</sup> day after the end of the first menstrual cycle for 3 months.

- **Procedures of diet:**

Each girl in both groups used the same low caloric diet. Girls followed a 1500 to 1100 calorie per day meal plan .

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# RESULTS



# **Body mass index (BMI) of both groups (A&B):**

## **i) Within Groups:**

- There was a highly significant decrease ( $P < 0.005$ ) of BMI in group (A) post treatment as mean difference was  $3.71 \text{ kg/m}^2$  with percentage of decrease equal 11.07 %
- There was a highly significant decrease ( $P < 0.005$ ) of BMI of group (B) post treatment as mean difference was  $2.54 \text{ kg/m}^2$  with percentage of decrease equal 7.65 %

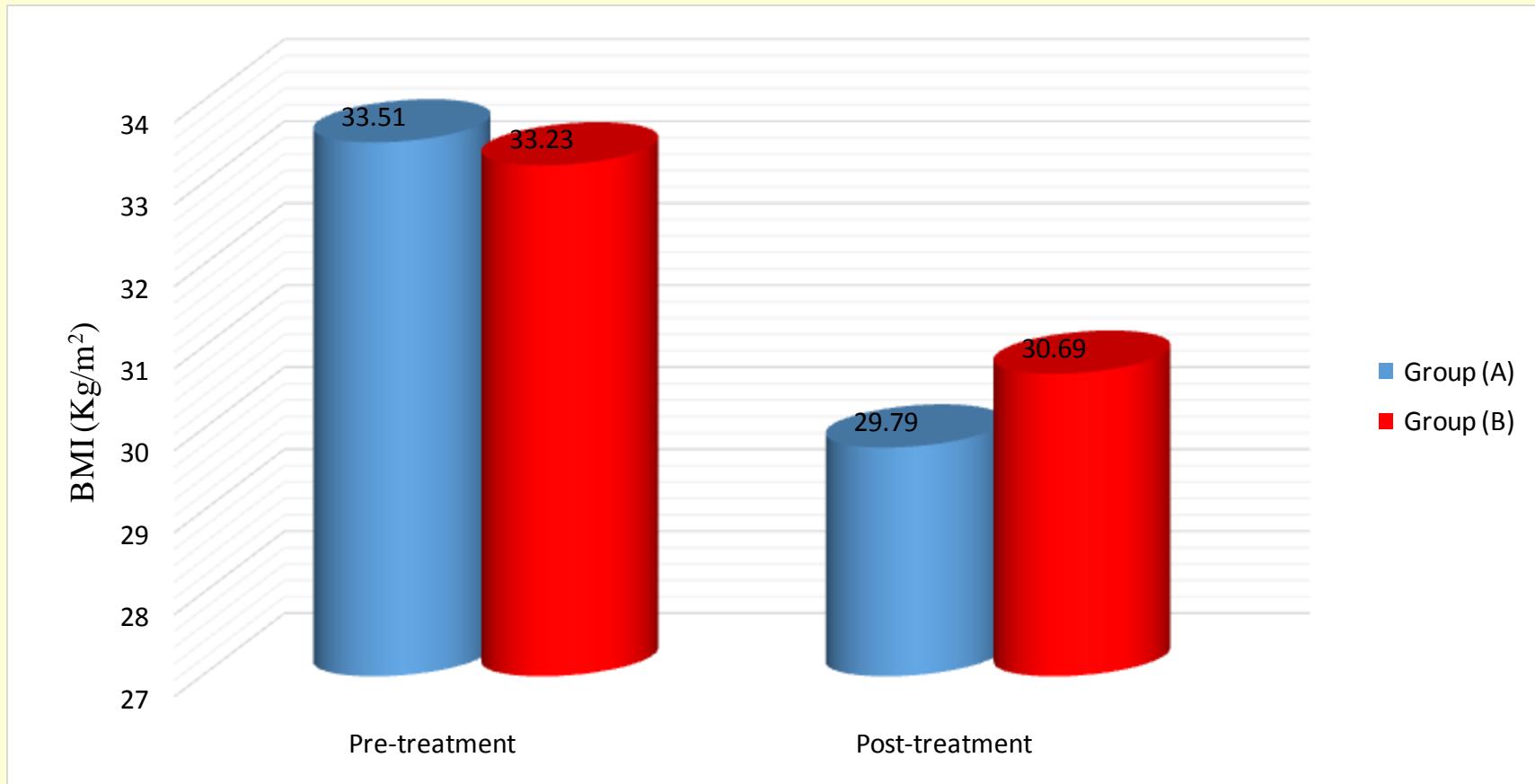
## **ii) between Groups:**

- There was a statistically non-significant difference ( $P=0.59$ ) & ( $P=0.09$ ) between both groups at pre as well as post treatment

# Mean values of the girls' BMI in both groups (A&B)

Items	BMI ( $\text{kg}/\text{m}^2$ )			
	Group (A)		Group (B)	
	Pre treatment	Post treatment	Pre treatment	Post treatment
Mean	33.51	29.79	33.23	30.69
$\pm \text{SD}$	$\pm 1.4$	$\pm 1.33$	$\pm 1.33$	$\pm 1.51$
Mean difference	3.71		2.54	
Percentage of change	11.07 %		7.65 %	
DF	14		14	
t-value	18.23		15.74	
p-value	< 0.005		< 0.005	
Level of significance	HS		HS	

# Mean values of the girls' BMI of both groups (A&B).



## **Waist /hip ratio (WHR) of both groups (A&B):**

### **i) Within Groups:**

- There was a non significant decrease ( $P=0.413$ ) of WHR in group (A) post treatment as mean difference was 10.133 with percentage of decrease equal 0.742 %.
- There was a non significant decrease ( $P=0.509$ ) of WHR in group (B) post treatment as mean difference was 0.0036087 with percentage of decrease equal 0.4596 % .

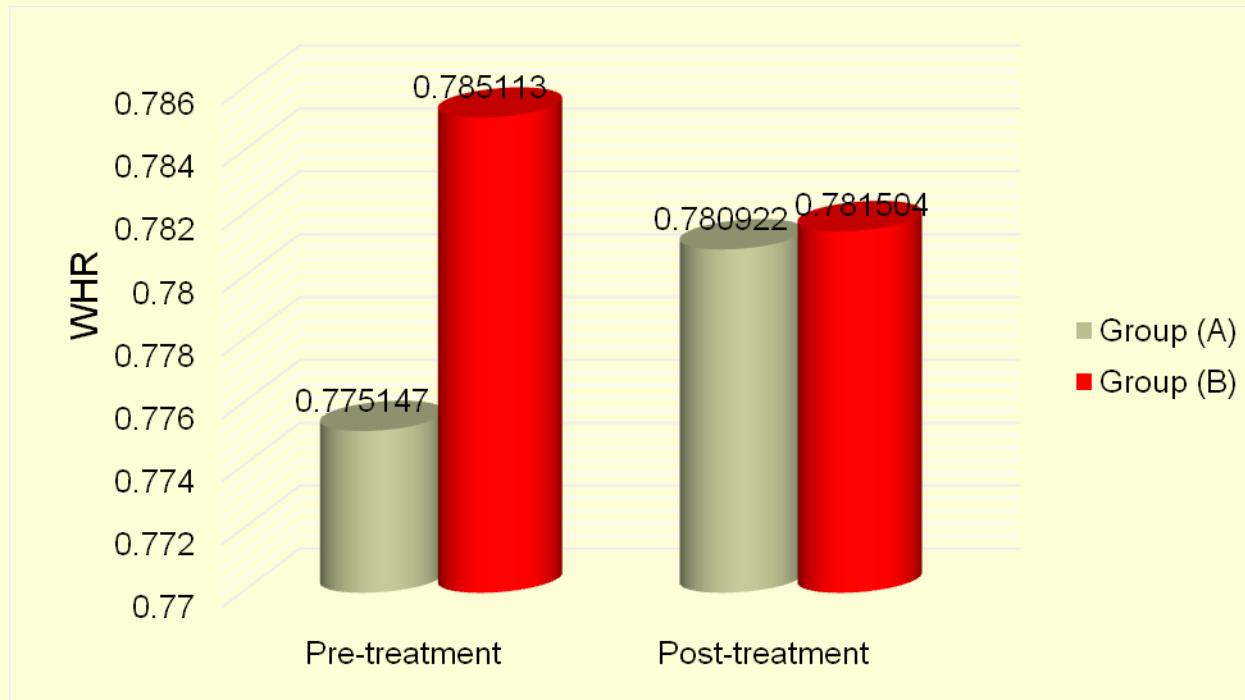
### **ii) Between Groups:**

- There was a statistically non-significant difference ( $P=0.553$ ) ( $P=0.975$ ) between both groups at pre as well as post treatment.

# Mean values and SD of the girls' WHR in both groups (A&B)

Items	WHR			
	Group (A)		Group (B)	
	Pre treatment	Post treatment	Pre treatment	Post treatment
Mean	0.775147	0.780922	0.785113	0.781504
± SD	± 0.043906	± 0.0513861	± 0.04694	± 0.04978
Mean difference	-0.0057749		0.0036087	
Percentage of change	0.742 %		0.4596 %	
DF	14		14	
t-value	-0.844		0.677	
p-value	0.413		0.509	
Level of significance	NS		NS	

# Mean values of the girls' WHR of both groups (A&B).



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## Estimation of Estrogen hormone level in both groups:

### i) Within Groups:

- There was a significant decrease ( $P=0.046$ ) of Estrogen hormone level of group (A) post treatment as mean difference was 5.86 pg/ml with percentage of decrease equal 12.58 %.
- There was a significant decrease ( $P=0.020$ ) of Estrogen hormone level of group (B) post treatment as mean difference was 1.54 pg/ml with percentage of decrease equal 7.65 %.

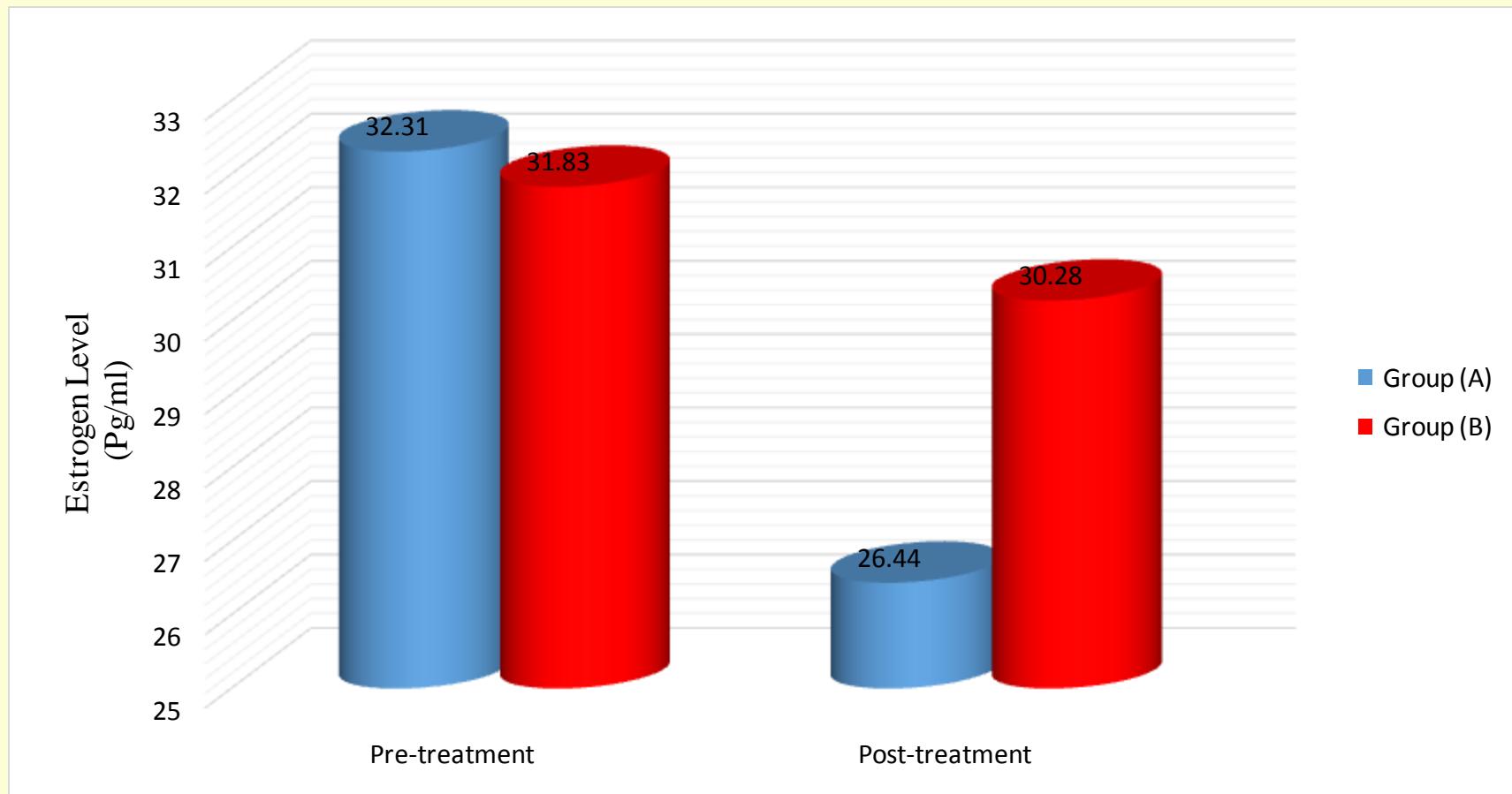
### ii) Between Groups:

- There was a statistically non-significant difference ( $P=0.90$ ) ( $P=0.21$ ) between both groups at pre as well as post treatment .

# Mean values of girls' Estrogen hormone level in both groups (A&B)

Items	Estrogen Level (pg/ml)			
	Group (A)		Group (B)	
	Pre treatment	Post treatment	Pre treatment	Post treatment
Mean	32.31	26.44	31.83	30.28
± SD	± 11.19	± 8.25	± 9.50	± 8.40
Mean difference	5.86		1.54	
Percentage of change	12.58 %		4.86 %	
DF	14		14	
t-value	2.18		2.63	
p-value	0.04		0.02	
Level of significance	S		S	

# Mean values of the girls' Estrogen hormone level of both groups (A&B).



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## Estimation of pain intensity by using Visual Analogue Scale (VAS) of both groups (A&B):

### i) Within Group:

- There was a significant decrease ( $P<0.001$ ) of VAS in group (A) post treatment as median difference was 2 with percentage of decrease equal 33.33 %.
- There was a non significant difference ( $P<0.02$ ) of VAS of group (B) post treatment program as median difference was 1 with percentage of decrease equal 16.67 %

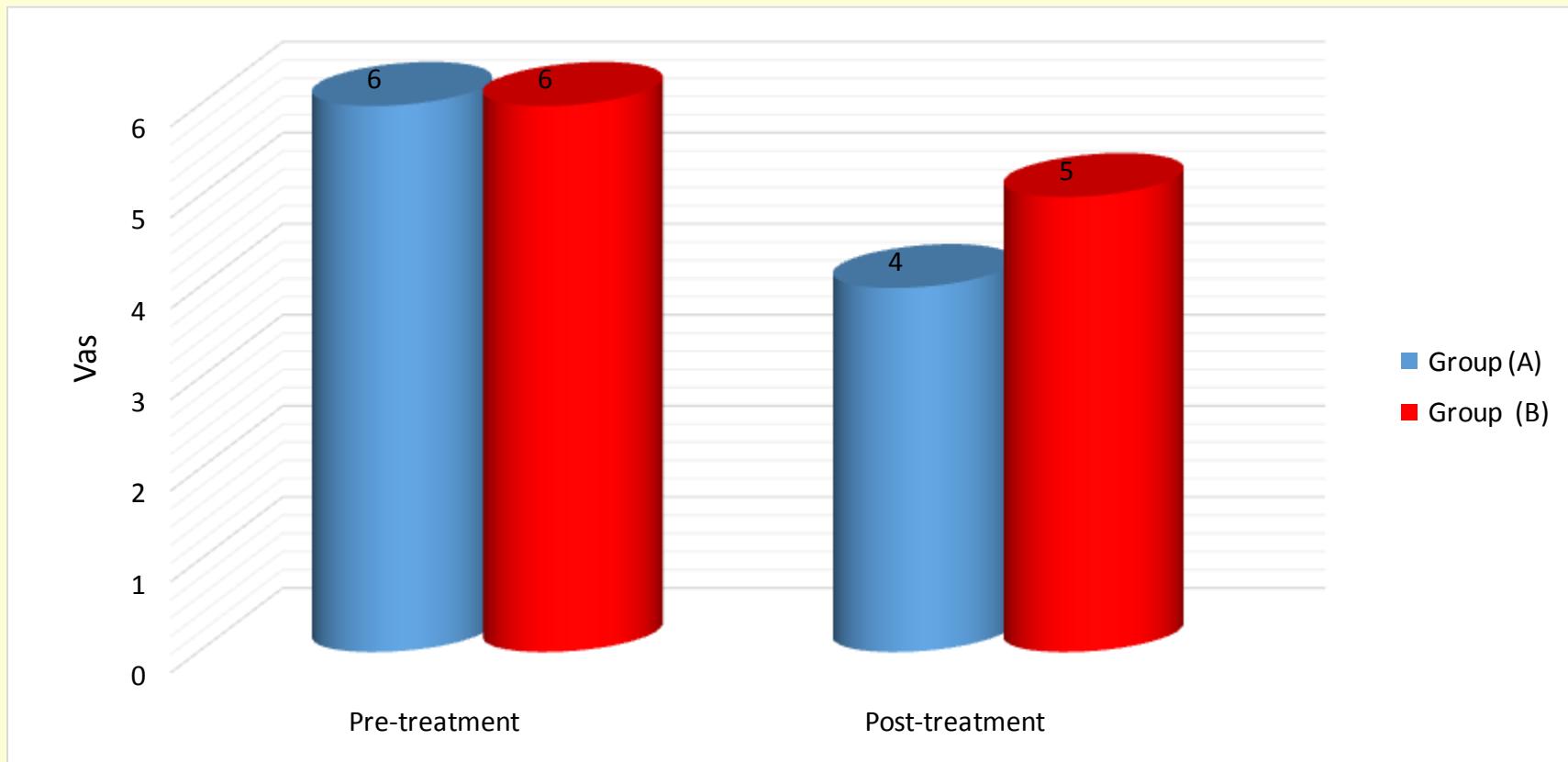
### ii) Between Groups:

- There was a statistically non-significant difference (total chi-square = 1.222 &  $P=0.543$ ) & (total chi-square = 0.619 &  $P=0.734$ ) between both groups at pre as well as post treatment.

# Pain intensity by using Visual Analogue Scale (VAS) of both groups (A&B)

Items	VAS scores			
	Group (A)		Group (B)	
	Pre treatment	Post treatment	Pre treatment	Post treatment
Median	6	4	6	5
Median difference	2		1	
Percentage of change	33.33 %		16.67 %	
Chi-square	8.4		2.8	
p-value	.015		0.247	
Level of significance	S		NS	

# Median values of the girls' VAS-Value of both groups (A&B).



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# Conclusion

Aerobic exercises and low caloric diet are non invasive methods for improvement of dysmenorrhea in obese girls and these girls should be advised to participate at training exercise and follow balanced diet to reduce dysmenorrhea.

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# RECOMMENDATIONS

- Further researches are needed to study the effect of another type of aerobic exercises on primary dysmenorrhea in obese girls.
- Further researches are needed to compare between low caloric diet, very low caloric diet, low fat diet and low carbohydrate diet on decreasing primary dysmenorrhea in obese girls.
- Arrange sessions to increase the awareness of girls about the benefits of exercises as well as diet in reducing primary dysmenorrhea.
- Further studies are needed to compare between electrical modalities as TENS and exercises in reducing primary dysmenorrhea.

Thank you