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INFLUENCE OF WEIGHT BEARING AND CALISTHENIC EXERCISE ON SELECTED PHYSIOLOGICAL VARIABLES AMONG PREGNANT WOMEN

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Abstract

The purpose of the study was to find out effect of calisthenics training programme on eosinophilia & haemoglobin among pregnant women. To achieve the purpose of this study forty two pregnant (Third Month) women were selected by random sampling method. Further they were scrutinized by gynaecologist doctor based on their medical history, health, willingness and past experience with exercise and training. Finally 30 women were selected for subjects of this study who living around Chennai, Tamil Nadu. The selected subjects were experience with kind of exercise and training. Further they are followers of medication as per the doctor's advice. However they were carefully assisted by the supervisor and professional doctors. The age of the selected subjects ranged between 25 to 35 years.The pre and post data were collected from the following dependent variables, such as Eosinophilia & Haemoglobin by blood test were used. Weight Bearing Exercise and Calisthenics training was selected as independent variables. Both the training programme limited with 5days in a week for 6 weeks. The collected data were analyzed statistically by Analysis of Covariance (ANCOVA) and whenever the 'F' ratio for the adjusted test was found to be significant Scheffe's Post hoc test was used. In all cases, 0.05 was performed to find out the significant mean differences. The result of the study showed that the significantly improved on selected criterion variables due to weight bearing exercise and calisthenics training, and also the study concluded that weight bearing exercise better that the calisthenics exercise on improving selected criterion variables among pregnant women.

Keywords: Weight Bearing Exercise (WBE), Calisthenics Exercise (CLE), Eosinophilia & Haemoglobin.

1. INTRODUCTION

Increasing number of women's engaging in recreational and occupational physical activity, including child bearing women (Heffernan, 2000). A physically active woman receives direct health benefits of physical activity, mainly reduced co morbidities, but a physically active pregnant woman also has reduced risk of pregnancy-related complications such as gestational diabetes. Poor maternal health and maternal co morbidities can impact the health outcomes of a newborn, so a physically active pregnant woman may see improved infant health outcomes due to the tendency for physical activity to improve overall health and reduce the risk of these co morbidities (Broadway,2018) Twenty years ago, science had conducted very little research on the effects of exercise during pregnancy. Without hard factual-evidence, doctors erred on the side of caution, and advised a sedentary lifestyle for their pregnant patients. Doctors advised women to limit their heart rates to no more than 140 beats per minute during pregnancy. Regular physical activity has been proven to result in marked benefits for mother and fetus. Maternal benefits include improved cardiovascular function, limited pregnancy weight gain, decreased musculoskeletal discomfort, reduced incidence of muscle cramps and lower limb oedema, mood stability, attenuation of gestational diabetes mellitus and gestational hypertension. Regardless of the specific physiological

changes induced by pregnancy, which are primarily developed to meet the increased metabolic demands of mother and fetus, pregnant women benefit from regular physical activity the same way as nonpregnant subjects. Fetal benefits include decreased fat mass, improved stress tolerance, and advanced neuro behavioural maturation. In addition, few studies that have directly examined the effects of physical activity on labour and delivery indicate that, for women with normal pregnancies, physical activity is accompanied with shorter labour and decreased incidence of operative delivery. When pregnant women perform submaximal weight-supported exercise on land (e.g. level cycling), the findings are contradictory. Doctors advised women to limit their heart rates to no more than 140 beats per minute during pregnancy. Calisthenics is a form of strength training which uses your body weight as resistance, rather than dumbbells or barbells. It is a great way to lose body fat, build muscle, and become toned. (Elizabethlangley, 2012).

Weight bearing exercise is the one of aerobic activities involve doing aerobic exercise on feet, with the bones supporting to the weight. Examples include walking, dancing, low-impact aerobics, elliptical training machines, stair climbing and gardening. These types of exercise work directly on the bones in your legs, hips and lower spine to slow mineral loss. They also provide cardiovascular benefits, which boost heart and circulatory system health. It's important that aerobic activities, as beneficial as they are for your overall health, are not the whole of your exercise program (Arthu, 2016).

Calisthenics is a form of strength training which uses your body weight as resistance, rather than dumbbells or barbells. It is a great way to lose body fat, build muscle, and become toned (Elizabethlangley, 2012). Engy Nahas, Amir Gabr (2016), revealed that adding aerobic exercises to medication has better effect on Haemoglobin level and scores of total symptoms of anemia than medication only.

2. METHODOLOGY

To achieve the purpose of these study forty two pregnant (Third Month) women were selected by random sampling method. Further they were scrutinized by gynaecologist doctor based on their medical history, health, willingness and past experience with exercise and training. Finally 30 women were selected for subjects of this study who living around Chennai, Tamil Nadu. The selected subjects were experience with kind of exercise and training. Further they are followers of medication as per the doctor's advice. However they were carefully assisted by the supervisor and professional doctors. The age of the selected subjects ranged between 25 to 35 years.

3. IMPLEMENTATION

3.1 Training Programmers

During the training period the experimental groups underwent six weeks of weight bearing exercise and callisthenic exercises programmers. The duration of training were planned for 45 minutes that is from morning 6.00am on Mondays to Fridays. After completion of six weeks of experimental period, the participants were retested as the pre test. All the subjects involved in this study were carefully monitored throughout the experimental period.

3.2 Statistical Tools

The pre and post data were collected from the following dependent variables, such as Eosinophilia and Haemoglobin by blood test were used. Weight Bearing Exercise and Calisthenics training was selected as independent variables. Both the training programme limited with 5 days in a week for 8 weeks. The collected data were analyzed statistically by Analysis of Covariance (ANCOVA) and whenever the 'F' ratio for the adjusted test was found to be significant Scheffe's Post hoc test was used. In all cases, 0.05 was performed to find out the significant mean differences.

Table.1 Analysis Of Co Variance On Eosinophilia Of Weight Bearing And Free Hand Exercise And Control Groups

Test	Ex-I	Ex-II	CG	Source of variance	Sum of Squares	df	Mean square	F
Pre-test mean	4.29	4.30	4.33	Between	0.009	2	0.004	0.17
				Within	0.693	27	0.026	
Post-test mean	5.30	4.99	4.30	Between	5.097	2	2.548	55.32*
				Within	1.244	27	.046	
Adjusted mean	5.31	4.99	4.31	Between	5.166	2	2.583	57.21*
				Within	1.174	26	0.045	

***significant at .05 level of confidence.**

(The table values required for significance at .05 level of confidence with df 2 and 27 and 2 and 26 were 3.35 and 3.37 respectively).

The Pre-Test: The calculated 'F' value was 0.17 correspondingly lower and indicates no significant changes. The post-test obtained 'F' value was 55.32 correspondingly higher than the required value and affirmed significant changes. The adjusted post-test: The obtained 'F' value was 57.21 correspondingly higher than the required 'F' value and affirmed significant changes.

Table:2 Scheffe S Test For The Difference Between The Adjusted Post-Test Mean Of Eosinophilia

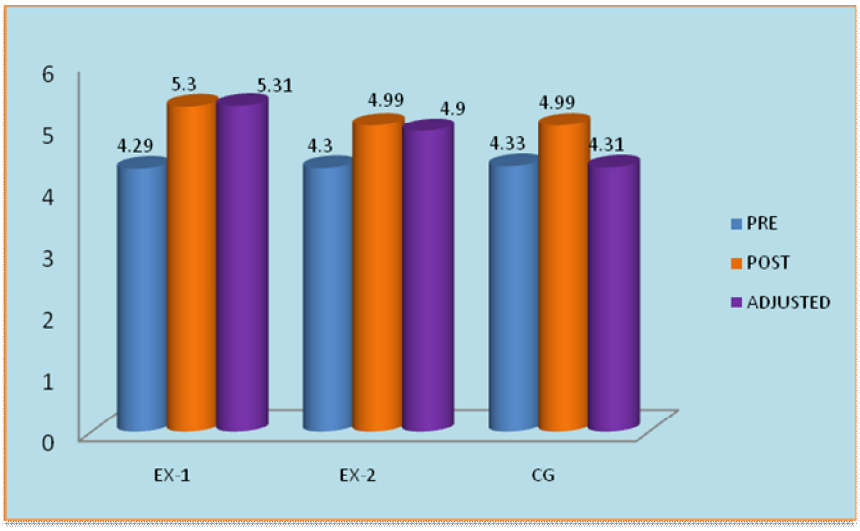
Experimental Group I	Experimental Group II	Control Group	Mean Difference	Confidence Interval
5.31	4.99		0.32*	0.13
5.31		4.31	1.00*	
	4.99	4.31	0.68*	

* Significant at .05 level of confidence.

The multiple comparisons showed in Table - II proved that there existed significant differences between the adjusted means of Ex – I and Ex – II was 0.32, Ex – I and CG was 1.00; Ex- II and CG was 0.68 at 0.05 level of confidence with the confidence interval value of 0.13.

The pre, post and adjusted means on flexibility were presented through bar diagram for better understanding of the results of this study in Figure-1.

Fig.1 Pre, Post And Adjusted Post Test Differences Of The Experimental Groups And Control Group On Eosinophilia



4. RESULTS

Table:4 Analysis Of Co Variance On Haemoglobin Of Weight Bearing And Free Hand Exercise And Control Groups

Test	Ex-I	Ex-II	CG	Source of variance	Sum of Squares	df	Mean square	F
Pre-test mean	11.61	11.62	11.26	Between	0.83	2	0.415	1.02
				Within	11.04	27	0.409	
Post-test mean	13.53	12.18	11.20	Between	27.48	2	13.740	16.24*
				Within	22.85	27	0.846	
Adjusted mean	13.50	12.16	11.26	Between	24.522	2	12.261	14.35*
				Within	22.220	26	0.855	

*significant at .05 level of confidence.
(The table values required for significance at .05 level of confidence with df 2 and 27 and 2 and 26 were 2.59 and 2.60 respectively).

The Pre-Test: The calculated 'F' value was 1.02 correspondingly lower and indicates no significant changes. The post-test obtained 'F' value was 16.24 correspondingly higher than the required value and affirmed significant changes. The adjusted post-test: The obtained 'F' value was 14.35 correspondingly higher than the required 'F' value and affirmed significant changes.

Table 5: Scheffe S Test For The Difference Between The Adjusted Post-Test Mean Of Haemoglobin

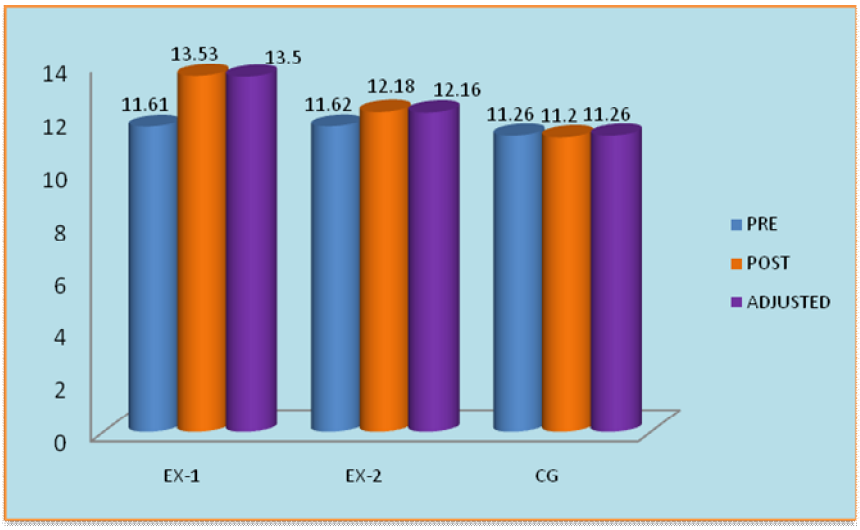
Experimental Group I	Experimental Group II	Control Group	Mean Difference	Confidence Interval
13.50	12.16	-	1.34*	0.14
13.50	-	11.26	2.24*	
-	12.16	11.26	0.90*	

* Significant at .05 level of confidence.

The multiple comparisons showed in Table - IV proved that there existed significant differences between the adjusted means of Ex – I and Ex – II was 1.34, Ex – I and CG was 2.24; Ex- II and CG was 0.90 at 0.05 level of confidence with the confidence interval value of 0.14.

The pre, post and adjusted means on flexibility were presented through bar diagram for better understanding of the results of this study in Figure-1.

Fig 2.Pre, Post And Adjusted Post Test Differences Of The Experimental Groups And Control Group On Haemoglobin



The discoveries of this investigation were in concurrence with the discoveries of Engy Nahas, Amir Gabr (2016) revealed that adding aerobic exercises to medication has better effect on Haemoglobin level and scores of total symptoms of anemia than medication only. Plowman, Smith. (2011) find out Aerobic exercise can change the number of red blood cells and haemoglobin level in several ways. Endurance training may increase the number of red blood cells and may destruct them in some cases Hu, Lin. (2012) Exercise training can increase total Haemoglobin and red cell mass, which result in enhancing oxygen carrying capacity. Bone marrow stimulation, including stimulated erythropoiesis with hyperplasia of the hematopoietic bone marrow and improvement of the hematopoietic microenvironment are possible under lying mechanisms of effect of exercise training.

5. CONCLUSIONS

The result of the study concluded that the significantly improved on eosinophilia and haemoglobin variables due to weight bearing exercise and calisthenics training, and also the study concluded that weight bearing exercise better that the calisthenics exercise on improving selected criterion variables among pregnant women.

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