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Isolated and combined effect of brisk walking and Pilates training on blood glucose level among middle Aged women

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Abstract

The purpose of the study was to find out the “Isolated and Combined effect of Brisk walking and Pilates training on Blood Glucose level among middle aged women”. To achieve this purpose, Twenty one middle aged women between the age group of 30-45 years residing at Thiruvananthapuram were selected as the subject of the study. They were randomly divided into three experimental groups of Seven subjects each. Group I is Brisk Walking group, group II was imparted training in Pilates training and group III was engaged structured form of combined Brisk-walking and Pilates training during the experimentation period. All 3 groups underwent their specified training programme 3 times a week for a period of 3 months. All the subjects of the three groups were tested on dependent variable of Fasting Blood Glucose level before and after training period. The data pertaining to the variable in this study were examined by using dependent t-test and Analysis of Covariance (ANCOVA). Three experimental Groups namely Brisk-walking group, Pilates training group and combined training group have significant reduction in Blood Glucose level. It was concluded in short that the Combined form of Brisk-walking and Pilates training is as good when compared to isolated Brisk Walking and Pilates training.

Keywords: Isolated effect, combined effect, brisk walking, Pilates training, blood glucose level and middle aged women

Introduction

Body gets glucose mainly by the digestion (metabolism) of carbohydrates in the food we eat. By the action of digestive enzymes, carbohydrates are hydrolyzed to glucose. Glucose is absorbed by the intestinal walls and enters into the blood stream. Glucose is very essential for the body to produce energy as well as proper functioning of brain. So body maintains the blood glucose level within a limit all the time. It is called homeostasis of blood glucose level. In a normal person the blood glucose level in fasting stage (FBS-fasting blood sugar level) is between 80mg and 100mg per 100ml blood. In a diabetic patient it is above 126 mg/100ml. Fasting stage is 8 hours after the last meal. FBS level is tested in the morning.

Helmrich *et al.* (1991) ^[4] found that increased physical activity helps prevent type II diabetes and is especially important for those with the highest risks. Physical activity burns calories and helps maintain or reduce weight, and it also can improve the body’s response to insulin. Helmrich *et al.* also reported a decreased risk of developing type II diabetes for each weekly caloric expenditure increase of 500 (from a range of 500 to 3500 calories expended per week). In addition, Manson *et al.* (1991) ^[5] found that women between the ages of 34 and 59 reduced their risk of developing diabetes by about 33% when they engaged in vigorous physical activity at least once a week.

Increased physical activity assists to reduce the blood glucose level in the body, so as to attaining the highest level of physical health. Physical activity helps maintain or reduce weight, and it also can improve the body’s response to insulin. Regular brisk walking and Pilates training threshold the fitness of all the major and minor muscle groups, including the face, neck, torso, shoulder, hip, even ankle, feet, wrist and back of the body. Through these training the women can achieve better strength, tonicity and increased range of motion and bring nourishment to internal organs. In addition, may leads to increased level of breathing, this can improve the total lung capacity in fact send oxygen to the cell by way of conscious

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intense breathing as well as sustained stretching and contraction at different muscle groups. Pilates training is the systematic physical exercises to control the breath with coordinative movement and with holding the position to stretch and strengthen various part of the body (Wikipedia).

Hypothesis

The formulated hypothesis in the present study is; there will be significant changes in Fasting blood sugar level among middle aged women due to 3 months of selected experimentation.

Methodology

The purpose of the study was to determine the effect of Isolated and Combined training of Brisk walking and Pilates training on Blood Glucose level among middle aged women”. To achieve this purpose, twenty one middle aged women in the age range of 30-45 years residing at Thiruvananthapuram were selected as the subject for the study. Women who have any health issues were not included in the study. The selected subjects were randomly divided into three experimental groups of seven subjects each. Group I underwent Brisk-walk training, group II underwent Pilates training and group III underwent structured form of combined Brisk-walking and Pilates training during the experimentation period. All 3 groups underwent their specified training programme 3 times a week for a period of 3 months. Along with the systematic warming up and warming down, eighteen selected Pilates exercises were included in Pilates training programme and

various intensity Brisk walking is included in Brisk walking training programme. The training programme was same throughout the period, the only difference was increases the intensity of training in each weeks. All the subjects of the three groups were tested on dependent variable of Fasting Blood Glucose level before and after training which were measured with the help of ISA approved Digital Glucometer. The glucose in the blood was measured in mg/100ml. The normal range of Fasting Blood Sugar Level in the blood is 80-100mg/100ml.

Experimental design and statistical analysis

The Pre and Post-test random group design and systematic random sample selection were employed by the researcher for this study. The data obtained from the experimental groups before and after training were statistically analyzed with dependent t-test and Analysis of Covariance (ANCOVA). Whenever the F-ratio for adjusted post-test was found to be significant, to determine which of the three paired means significantly different; the Scheffe’s test was applied as post hoc test. The criterion for the statistical significance was set as 0.05 level of confidence.

Analysis of data and result

The data pertaining to the study from the criterion variable selected were examined and analyzed by using the statistical package SPSS Using ‘t’ test and ANCOVA were used. The influence of independent variables were analyzed and presented in table 1.

Table 1: Mean, standard deviation and dependent ‘t’ test for the pre and post test on blood glucose level of brisk walking group, pilates training group and combined training group

Test	Brisk walking group	Pilates training group	Combined training group
Pre-test mean +- SD	91.16 +- 7.72	88.62 +- 8.22	92.46 +- 10..02
Post-test mean +- SD	88.43 +- 8.22	84.88 +- 7.62	87.83 +- 7.04
t-test	8.26*	8.08*	7.82*

*significant at 0.05 and table value 2.45

From table 1 is clearly stated that, the obtained t test values 8.26, 8.08 and 7.82 of Brisk walking, Pilates training and combined training respectively, were greater than the table 2.45 with df. at 0.05 level of confidence. That means the

given hypothesis is accepted. Hence it is concluded that Brisk-walking group, Pilates training group and combined training programme group had significantly decreased the Blood Glucose level.

Table 2: Analysis of covariance on blood glucose level of brisk walking group, Pilates training group and combined training group

Adjusted Post test Mean			Source of variance	Sum of squares	d/f	Mean squares	F-ratio
Brisk walking group	Pilates training group	Combined training group					
89.26	86.66	85.88	Between	24.26	2	12.85	3.84*
			Error	52.24	17	03.72	

Significant at 0.05 level of confidence

The table value required for significance at 0.05 levels with degrees of freedom 2 & 17 is 03.59.

Table 2 shows that the F ratio value was 3.84* which were greater than 3.59 with df. 2 and 17 required for significance for significance at 0.05 level. So the stated hypothesis in the

research is accepted. So that the result of the study indicates that there was significant differences exist among the adjusted posttest means of Brisk walking group, Pilates training group and Combined training programme group on Blood glucose level.

Table 3: Analysis of covariance on blood glucose level of brisk walking group, Pilates training group and combined training group

Adjusted Post Test Mean			Mean Difference	Confidence Interval
Brisk walking group	Pilates training group	Combined training group		
89.26	86.66		2.6	7.46
89.26		85.88	3.38	
	86.66	85.88	0.78	

Significance at 0.05level.

From the results obtained after the three months training among middle aged women, table 3 reveals that the isolated Brisk walking group, isolated Pilates training group and Combined training programme group have some differences on Blood glucose level. Among the three experimental groups, Combined training group (Training Brisk walking and Pilates practices together) showed better improvement in Fasting Blood Glucose level compared to other two isolated training group.

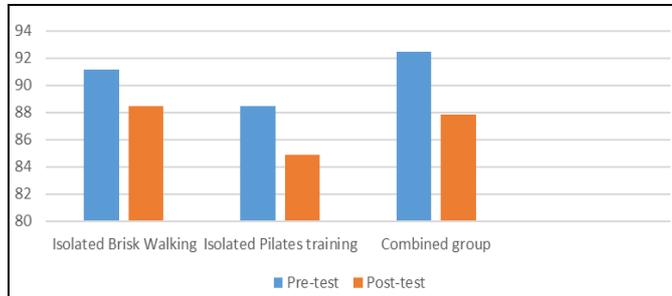


Fig 1: Mean value difference between the pre and post test on blood glucose level of brisk walking group, Pilates training group and combined training group

Discussion

There was a significant changes in all the subjects of various experimental group in the experimental training programme during the training period. That means all the three experimental groups had Shows significant improvement in blood glucose level (reduces FBS). This is because, most of the selected sample population of this study is sedentary in nature previously. During training session they are following to engage very systematic training packages. So their existed physiological sedentary condition is shifted to activated condition and this may help the person can attaining high level of wellness. Under this homeostasis the body can utilize more amount of macronutrients for energy expenditure as well as the given systematic regular training can helps the pancreatic beta cell to produce sufficient amount of insulin for energy conversion. In addition to that, the body could be reproduced new healthy cell which have very less magnitude of insulin resistivity, therefore each cell have a quality to absorb maximum amount of insulin inside the cytoplasm for cellular metabolism. The result of the present study are also in line with the observation by Bera, Gore and Oak (1997), Ann M Swartz and Dixie L Thompson (2002) ^[1] and Banaeifar and Abdolali (2006).

Conclusion

Based on the above statistical analysis and finding it is concluded that significant changes in dependent variables on Blood glucose level after the experimentation of three months isolated Brisk walking, isolated Pilates training and Combined training (Brisk walking and Pilates training) among Middle aged women. Again it is concluded that the combined training group is influenced greater effect after training and significantly reduced their blood glucose level than the other two groups.

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