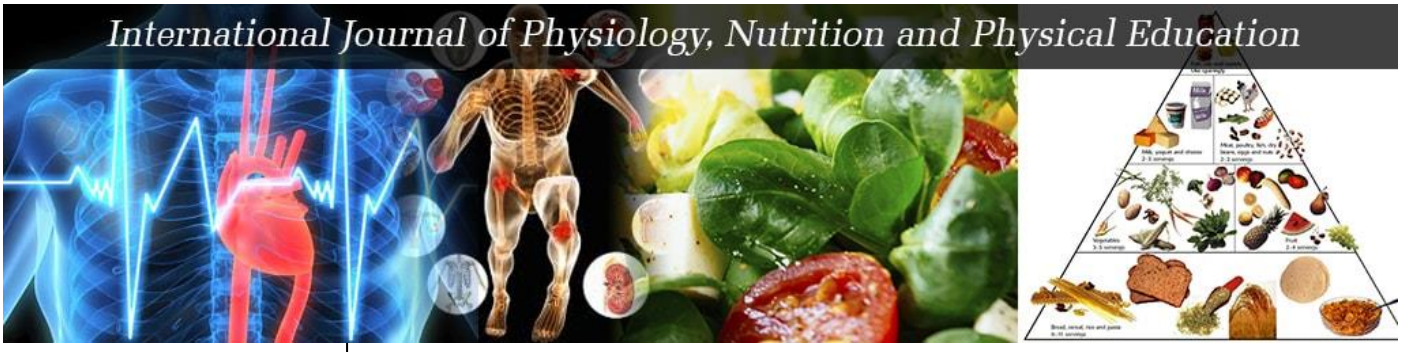

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Effectiveness of zumba on cardio-vascular endurance and fat percentage among sedentary female

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Abstract
This study proposed to determine the effects zumba on cardio-vascular endurance and fat percentage of forty (40) sedentary female aged 30 to 40 years. Pre-test and Post-test Measurements taken after a conditioning program showed significant changes in cardiovascular function for the experimental group 't' value 5.34 $p \leq 0.05$ but no change in control group 't' value 2. Similarly fat percentage level of sedentary female were also significantly reduced by zumba, as 't' value of experimental group was 2.45 and for control group the 't' value was 0.31, which are not significant at 0.05 level.

Keywords: Zumba, cardio-vascular endurance, fat percentage, sedentary female

Introduction
Group fitness exercises represent the form of programmed physical activity to improve health and change body shape. The zumba fitness is a new kind of dance workout, inspired by Latin American music and Latin American dances. The exercise combines the basic of dance merengue, salsa, samba, cumbia, reggeaton and other Latin American dances, uses basic aerobic steps, but also enriches their composition of the other dance like hip-hop, belly dancing, Indian, African dance, etc. It is fusion of basic principles of aerobic interval training and strengthening exercises which promote consumption of calories, improve cardiovascular system and strength of the whole body (Perez & Greenwood-Robinson, 2009). This modern approach of fitness exercising satisfies goals such as harmony of the body, improving posture and strengthening bone-joint segments of the locomotors apparatus (Furjan-Mandić, Kosalec, & Vlašić, 2011). Which through motivating music implement creative choreography primarily aimed to entertain the trainees. The advantage of this model of exercise is that every practice is a new entertainment based on various dance steps with different intensity and form of exercising, what makes the participants more motivated (Perez & Greenwood- -Robinson, 2009). This is very important from the aspect of maintaining interest for continuous exercise, since the main reason for leaving the group fitness program is monotony of each training session in long term of practicing (Stoiljković *et al*., 2010).

Methods and Materials
Selection of subjects
The present investigation was carried out on 40 sedentary female. These subjects were selected by the random sampling technique from the sultanpur (Uttar Pradesh). Their age group was 30 -40 years. The subjects selected for the present study were normal and clinical healthy.

Zumba fitness program
Zumba fitness exercise was performed three times per week in the evening. Each zumba training (60 minutes) contained basic principles of zumba exercise: warm-up, main part of the workout (zumba party section), cool down and stretching (Perez & Greenwood-Robinson, 2009). Exercise intensity is determined by the tempo of the music that changed during training sections. Warm up contained basic dance steps (March, step touch, side to side etc.) with gradually accelerating tempo of music, without leaps and jumps.

In the second part of the warm-up the muscle toning exercises were performed with soft intensity through dance variations, slightly squats were allowed. The goal of warming up was to increase body temperature, muscle blood flow, joint mobilization and the psychological preparation, as well. Total warm-up time was 8-10 minutes. The main part of the Zumba training was performed with 8-10 original zumba fitness songs. The dance choreographies and movements intensity was created in accordance with tempo changing of music. All Latin American dance choreographies (merengue, salsa, samba, belly dance, cha cha cha, tango etc.) with their differences in character and dynamics of movement (Lukić, 2006) provide dosing of exercise intensity. Each dance lasts 3-5 minutes, with pause of 15-30 sec. The aim of the main part of the training is that trainees enjoy the music and dance, and practice at the same time. Cool down as the final part of the training contained easy dance movement with soft music with mental and physical relaxing purpose. Stretching was performed for muscle relaxation, as also to prevent muscle soreness and increase body flexibility. There were not any jumps or squats allowed, and all the movements could be performed in standing, sitting or lying position. When program was constructed it was considered that intensity of exercising can be changed according to previous adaptability. The intensity of exercise is dosed by using toning sticks (zumba toning program) as well as by changing character of the dance moves in presented choreographies.

Sources of data

The sources of data to the present study were obtained from the randomly selected 40 sedentary female in the age group was 30-40 years from Sultanpur (Uttar Pradesh). The secondary data was collected from books, journals, magazines and articles in papers of physical education and sports at LNIPE Gwalior, library and besides; information was collected from the internet. All the 40 subjects were divided into experimental and control groups were administered the Harvard step test for the measurement of their cardio-vascular endurance and body fat was measured with the help of skin-fold calipers at four body sites (Biceps skin-fold, Triceps skin-fold, sub scapular skin-fold and Supra-iliac skin-fold). After 12 weeks of Zumba training post tests were conducted in the same manner as pre-tests were conducted.

Results

The results of the presented study are presented in following tables and illustrations.

Table 1: Showing the Score of Cardio-Vascular Endurance, the Control Group of sedentary female Pre Test and Post Test

Control group	Mean	Mean Difference	Standard error	't' ratio
Pre test	77.36	2.45	1.14	2
Post test	81.65			

Analysis of data:- 1. The initial mean value of cardio-vascular endurance was measured with the help of Harvard step test of control group of pre test 77.36. The final mean value of cardio- vascular endurance of control group of post test was 81.65. Thus the resultant mean difference of pre test and post test were2.45. Control group was not found statistically significant. The value of 't' ratio was 2, this value was not significant at 0.05 level because the value of 't' ratio should be greater than 2.02.

To be significant at 0.05 level the value of 't' ratio should be greater than 2.02.

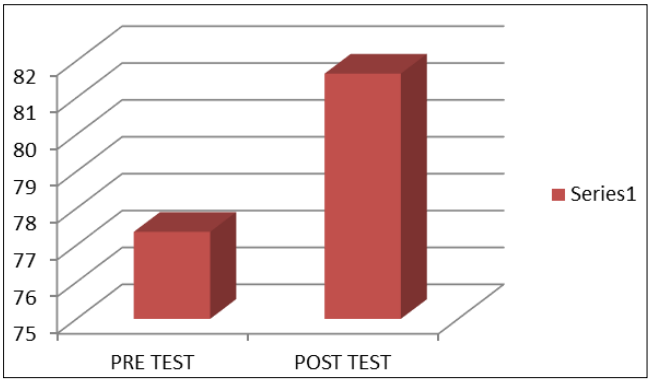

Fig 1: Showing the score of cardiovascular endurance of control group

Table 2: Showing the Score of Cardio-Vascular Endurance, the Experimental Group of sedentary female Pre Test and Post Test

Control group	Mean	Mean Difference	Standard error	't' ratio
Pre test	82.45	5.12	0.87	5.34*
Post test	93.36			

*Significant at 0.05 level

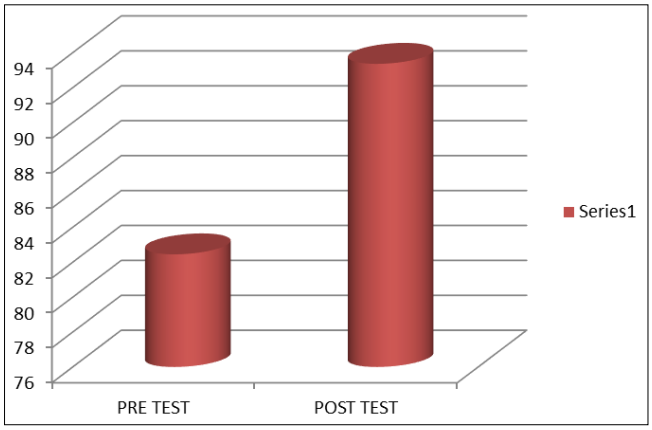

Fig 2: Showing the score of cardiovascular endurance of Experiment group

The initial mean value of cardio-vascular endurance was measured with the help of Harvard step test of experimental group of pre test 82.45. The final mean value of cardio - vascular endurance of experimental group of post test was 93.36 at the conclusion of six weeks of experimental period. Thus the resultant mean difference of pre test and post test was 5.12. Experimental group was found statistically significant. The value of 't' ratio was 5.34. This value was significant at 0.05 level because the value of 't' ratio was greater than 2.02.

Thus, this showed that there was an effect of zumba on cardiovascular endurance.

Table 3: Showing the Score of Fat Percentage, the Control Group of sedentary female Pre Test and Post Test.

Control group	Mean	Mean Difference	Standard error	't' ratio
Pre test	32.36	0.29	1.09	0.31
Post test	35.57			

The initial mean value of percentage of fat was measured with the help of skin-fold measurement of control group of pre test was 32.36. The final mean value of percentage of fat of control group of post test was 35.57. Thus resultant mean difference of pre test and post test were 0.29. Control group was not found statistically significant. The value of 't' ratio

was 0.31 this value was not significant at 0.05 level because the value of 't' ratio was smaller than 2.02.
To be significant at 0.05 level the value of 't' ratio should be greater than 2.02.

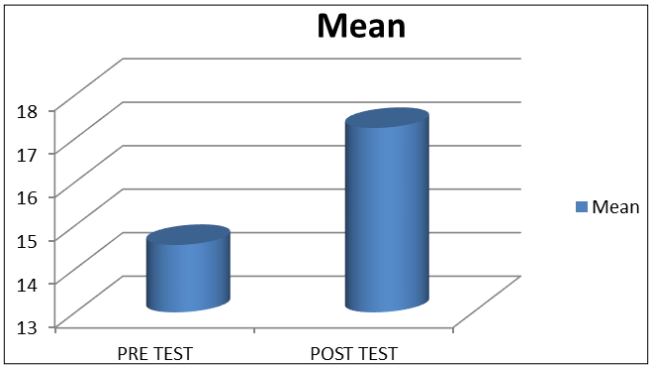

Fig 3: Showing the score of percentage of fat of control group

Table 4: Showing the Score of Fat Percentage, the Experimental Group of sedentary female Pre Test and Post Test.

Control group	Mean	Mean Difference	Standard error	't' ratio
Pre test	14.55	1.24	1.04	2.45
Post test	17.24			

The initial mean value of percentage of fat was measured with the help of skin- fold measurement of experimental group of pre test was 14.55.the final mean value of percentage of fat experimental group of post test was 17.24. thus, the resultant mean difference of pre test and post test were 1.24. Experimental group was found statically significant. The value of 't' ratio was 2.45 this value was significant at 0.05 level because the value of 't' ratio was greater than 2.02.
To be significant at 0.05 level the value of 't' ratio should be greater than 2.02.
Thus this showed that there was effect of zumba on percentages of fat.

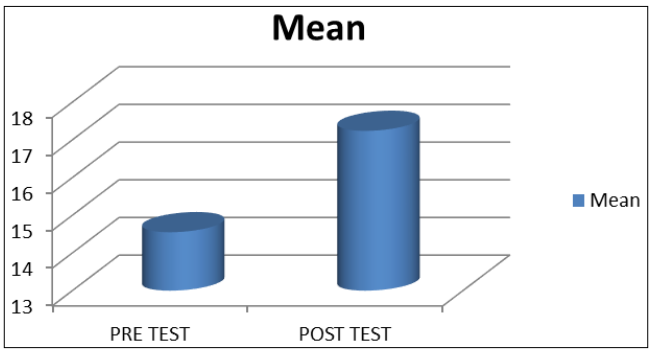

Fig 4: Showing the score of percentage of fat of experimental group

Conclusion

Zumba showed beneficial results to the physique of the sedentary female. The activates sustain rigorous efforts to recovers and resist fatigue which was a result of their increased cardio-vascular endurance.

1. The cardio-vascular endurance of the control group showed no significant changes on post test measurements. Thus, it can be concluded that the sedentary female who never practice zumba cannot raise their cardio-vascular endurance.
2. The cardio-vascular endurance of the experimental group showed significant changes on the post test measurements. Thus, it can concluded that zumba enhances the cardio-vascular endurance of the sedentary female.
3. The fat percentage of the control group showed no significant changes on post test measurement. Thus, it can be concluded that the sedentary female who don't do zumba cannot reduced their fat.
4. The fat percentage of the experimental group showed significant changes on post test measurement. Thus, it can be concluded that zumba can reduced their fat within duration of 12 weeks.

Recommendations

Taking into consideration the benefits and advantages of zumba, it is recommended that-

a. Women of older age more than 25 years should also be motivated to participate in zumba.
b. Research wok on zumba may be undertaken to find out the hurdles and constraints in adapting this activity.
c. Similar research work can be carried out with view to study their effects on adolescent girls, women of different age groups, players, non-players and so on.
d. The scope of the research is not just limited girls and women, but similar type of research can be carried out on men of different age groups and so on.
e. Government should provide adequate grants for the zumba activities to educational institutes.
f. Zumba should be popularized through newspapers and electronic media giving its significance to health and fitness.
g. Obese women should be motivated to participate in the zumba program for fat education. The duration may be more.
h. Overweight women should also be inspired to participation in zumba program so that they can reduce their weight in a play-way method.

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