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Effects of Isolated and Combined Effects of Aerobic Dancing and Resistance Training on Body Composition of Type-2 Diabetic Patients

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Abstract

The objective of the present experimental research was to find the isolated (individual) and combined training effect of aerobic dancing and resistance training on the component of body composition. For this purpose, sixty type-2 diabetic patients from in and around Karaikudi town, Sivaganga District were chosen as subjects. Their age was 40 to 45 years. The chosen patients were divided into four groups, each group consisting of 15 patients. The group-1alloted for aerobic dancing, group-2 allotted for resistance training and group -3 allotted for combined training of aerobic training and resistance training and group-4 served as a control group. The body composition was chosen as a dependent variable and it was measured by BMI observation. It was tested to the patients before and after the 12 weeks of the training intervention. The data of body composition was statistically analyzed with the tool of analysis of covariance (ANCOVA), to find the significant differences among the groups. To find out the significant differences between the groups, the Scheff's Post Hoc Test was used. The result of the study showed the 12 weeks of isolated (individual) and combined training of aerobic dancing and resistance training have produced significant positive alteration on body composition.

Keywords: Isolated, Aerobic, Dance, Resistance, Training, Body composition.

INTRODUCTION

There is a global diabetes epidemic. Over 180 million people worldwide have diabetes, and predict that by 2030 this number is likely to more than double. Minimum 65% of the public having diabetes mellitus die from some form of blood vessel disease or heart problems [1]. Also, most of the kidney failures are caused by the diabetes; 10% to 20% of kidney failure patients die with diabetes [2]. It is necessary to perform some of the physical activities regularly, to escape from the possibility of osteoporosis, cardiovascular diseases, hypertension, diabetes and other illnesses and to get normal functioning of all the systems and organ of the human body [3]. Diabetes, the most common endocrine disorder, affects multiple organs and body functions, causing serious health complications, such as renal failure, heart disease, nerve damage, stroke, and blindness.

Because of insufficient insulin, the body not able to control the level of circulating blood glucose. The hormone to control the blood glucose is homeostasis [4]. Children and young people are now recommended to take part in minimum sixty minutes of moderate to vigorous physical activity daily to promote and protect healthy heart function, increase bone and muscle strength, improve mood and lower the depression and reduce the threat of obesity, osteoporosis and diabetes [5]. The result of strength training produces the hypertrophy of the muscle fibre and enhances the contractile proteins. These are contributing to producing the contractile force [2]. For the entry-level athletes, the strength training will give a result of strength development in athletes [6].

Aerobic means with oxygen (O_2) and refers to the use of oxygen (O_2) in the body's metabolic system or energy-generating process. Aerobic exercise refers to exercise that involves or improves oxygen consumption by the body [7]. Aerobic metabolism plays a vital role in human performance and is basic to all sports, if for no other reason than recovery [8]. Aerobic dance can be helpful to develop cardiovascular endurance because oxygen (O_2) is supplied around the body through the blood vessels and pumped by the heart. The aerobic system can only work when the energy demand is low intensity for the heart to supply the muscles with a

satisfactory supply of oxygen. In aerobic exercise, the body is operating at a level in which the supply of oxygen is sufficient to the body's requests for oxygen. By doing aerobic dance, bodyweight also can be reduced [9]. Aerobic exercise is the keystone of fitness by doing aerobics it increases the capillary network in the body [10].

Aerobic dancing is a very good activity for people who want to be physically fit and stay fit the enjoyable way. If done properly, it contributes to a few levels in the maintenance of youthful fitness, thus helps slow down ageing. During the aerobic activity, the pulse is taken after every dance piece to observe if the desired heart rate is reached and maintained for duration of about 12 to 20 minutes. This will enable the heart to do the necessary workouts to increase its endurance and efficiency [11]. Resistance exercises have value in the treatment of orthopaedic injuries, low back pain, osteoporosis, overweight and obesity, sarcopenia and diabetics Mellitus. Moreover, resistance training may help reduce an older person's susceptibility to falls. Weight training has also been shown to attenuate the rate-pressure product when any given load is lifted [12].

METHODOLOGY

The chosen patients were divided into four groups, each group consist of 15 patients. The group-1alloted for aerobic dancing (AD), group-2 allotted for resistance training (RT) and group -3 allotted for combined training (AT+RT) of aerobic training and resistance trains and group-4 served as a control group. The body composition was chosen as the dependent variable and it was measured by BMI observation, scores recorded in percentage. It was tested to the patients before and after the 12 weeks of the training intervention. The duration of training was 12 weeks; the patients have performed their respective training as per the stipulated training program.

RESULTS

The statistical result of the present experimentation presented in the following Tables:

Table-I: The outcome of analysis of covariance (ancova) on body composition of selected groups (Score in percentage)

Test Conditions		Group AD	Group RT	Group (AT+RT)	Group CG	SV	SS	Df	MS	'F' Ratio
Pretest	Mean	34.33	34.27	35.33	34.27	B	10.80	3	3.60	1.21
	S.D.	1.68	1.44	2.16	1.53	W	166.53	56	2.97	
Post-test	Mean	31.13	32.80	30.33	35.93	B	276.45	3	92.15	42.16*
	S.D.	1.25	1.32	1.76	1.53	W	122.40	56	2.19	
Adjusted post-test	Mean	31.39	33.11	29.82	35.88	B	300.81	3	100.27	248.82*
						W	22.16	55	0.40	

*Significant at .05 level of confidence. The needed table value to test the significance was 2.77 and 2.77 with the df of 3 and 56, 3 and 55.

The mean and standard deviation (SD) of pre-test scores on body composition of aerobic dancing, resistance training, combined training and control group was 34.33+ 1.68, 34.27+1.44, 35.33+ 2.16 and 34.27+ 1.53 respectively. The calculated F ratio for pre-test scores was 1.21, which is lesser than the required table F ratio of 2.77. It shows insignificant, hence it is noted that before start of the training, all the groups were in similar condition in body composition.

The mean and standard deviation (SD) of post-test scores on body composition of aerobic dancing, resistance training, combined training and control group was 31.13+1.25, 32.80+1.32, 30.33+1.76 and 35.93+1.53 respectively. The calculated F ratio for post-test scores was 42.16, which is higher than the required table F ratio of 2.77. It shows significant, hence it is noted that after the 12 weeks of stipulated training, the groups have produced positive alteration on body composition.

The adjusted post-test means scores on body composition of aerobic dancing, resistance training, combined training and control group were 31.39, 33.11, 29.82 and 35.88 respectively. The calculated F ratio for post-test scores was 248.82, which is higher than the required table F ratio of 2.77. It shows significant, hence it is noted that after the 12 weeks of stipulated training, the groups produced positive alteration on body composition.

The pre-test and post-test scores on body composition of selected groups are graphically represented below.

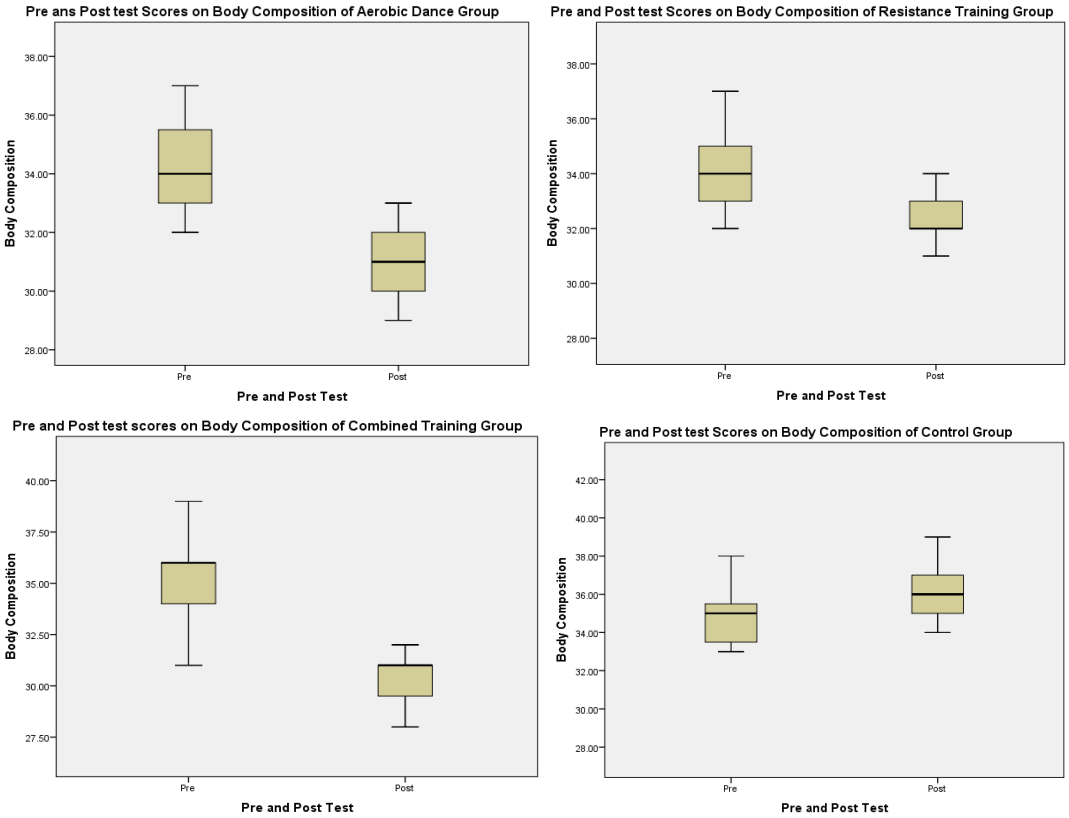

Table-II: The outcome of scheffe's post hoc test mean differences on body composition among the groups (scores in percentage)

Group 1 AD	Group 2 RT	Group 3 AD+RT	Group 4 C G	Mean Differences	Confidence Interval Value(CI)
31.39	33.11	-	-	1.72*	0.82
31.39	-	29.82	-	1.58*	0.82
31.39	-	-	35.88	4.49*	0.82
-	33.11	29.82	-	3.29*	0.82
-	33.11	-	35.88	2.77*	0.82
-	-	29.82	35.88	6.07*	0.82

* Significant at .05 level of confidence.

The table II shows the paired mean differences of aerobic dancing; resistance training, combined training and control group body composition.

The paired mean difference between aerobic dancing and resistance training, aerobic dancing and combined group, aerobic dancing and control group, resistance training and combined training, resistance training and control group, combined training and control group showed 1.72, 1.58, 4.49, 3.29, 2.77 and 6.07 respectively. These values are greater than the confidential interval (CI) value of 0.82. Hence, it is noticed that pairwise comparisons of above-said groups were produced a significantly different effect on body composition.

DISCUSSION ON FINDINGS

The present research has been useful to confirm many of the finding of earliest studies on this subject. The major findings of earlier studies are given here for comparison with the present findings.

K Sudha, D Maniazhagu [13] revealed that the circuit training combined with a resistance band and skipping rope produced greater improvement on muscular endurance and reduced percentage of body composition. Dejan et al., [14] found that effects of dance aerobics on body composition in young people show that the training of the appropriate dance aerobics models can affect body composition in conditions of reducing the body weight, body fat percentage, visceral fat and increasing "lean body mass" or "fat-free mass". BS Sekhon. Maniazhagu [10] found that the aerobic training and jump rope training groups demonstrated significant reduction by 0.03% and 0.02% respectively fairly than the control group. Sanders, Cardaci, McFadden, Walker, Bozzini, Cintineo [15] found that no significant alteration was noted in body composition due to the eight weeks intervention of resistance training. Mohd Faridz Ahmad, Muhammad Amir Asyraf Rosli [16], found that six-week long aerobic dance program would have a positive effect on cardiovascular fitness and weight.

Hence, aerobic dance might be used as a substitute for people who wish to direct a healthy lifestyle enjoyably. Kalaiarasi, Maniazhagu [17] found that the aerobic dancing produced significant alteration on body composition in college women students. Leslie et al. [18] found that program of combined aerobic training and resistance training did not result in significantly more fat mass or body mass reductions over AT alone.

CONCLUSIONS

The end results of this study showed that the selected three training interventions namely aerobic training, resistance training and combined training would significantly decrease the percentage of body composition in the type-2 diabetic patients. However, the combined training had influenced greater alteration of body composition. Further aerobic training has produced significant alteration in the value of body composition than the resistance training. The least alteration was noticed in the resistance training group on body composition than the control group. No alteration was noted in body composition on the control group.

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