



EFFECTS OF ISOLATED AND COMBINED EFFECTS OF AEROBIC DANCING AND RESISTANCE TRAINING ON RESTING PULSE RATE OF TYPE-2 DIABETIC PATIENTS

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ABSTRACT The purpose of study was to find out the effects of isolated and combined effects of aerobic dancing and resistance training on resting pulse rate of type-2 diabetic patients. To achieve the purpose of the study, 60 type 2 diabetic patients with the age of 40-45 years from Karaikudi town, Sivaganga District, Tamilnadu were selected as subject at random. The study was formulated as pre and post test random group design, in which sixty subject were divided into four equal groups. The experimental group-1 (n=15, AD) underwent aerobic dancing, experimental group-2 (n=15, RT) underwent resistance training, experimental group-3 (n=15, COM-T) underwent combined practice of aerobic dancing and resistance training and group-4 (n=15, CG) served as a control group. In this study, three training programme were adopted as independent variable, i.e., aerobic dancing, resistance training and combined training. The resting pulse rate was chosen as dependent variable. It was tested by number of beats per minute, scores recorded in number. The collected pre and post data was critically analyzed with apt statistical tool of analysis of co-variance. The Scheffe's post hoc test was used to find out pair-wise comparisons between groups. The results of the present study proved that the three training interventions have significantly altered the resting pulse rate.

KEYWORDS :

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. At least 65% of people with diabetes mellitus die from some form of heart or blood vessel disease (American Heart Association 2008). Also, diabetes is among the leading causes of kidney failure; 10% to 20% of people with diabetes die of kidney failure (Maniazhagu, 2020). 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. The body cannot control the level of circulating blood glucose because of either insufficient insulin production or inadequate response by organs to circulating levels of insulin, the major hormone controlling the body's glucose homeostasis. (Maniazhagu, 2019) Children and young people are now recommended to take part in at least 60 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 risk of depression and reduce the risks of obesity, osteoporosis and diabetes. (Malar, Maniazhagu, 2020) Strength training has been reported to cause muscle fiber hypertrophy, associated with an increase in contractile protein, which contributes to an increase in maximal contractile force. (Maniazhagu, 2020) During the early stages of strength training, especially with entry-level athlete almost any strength training method or program will result in strength development to some degree. (Maniazhagu, Malar, Manogari, 2019)

Aerobic means with oxygen and refers to the use of oxygen in the body's metabolic system or energy generating process. An aerobic exercise refers to exercise that involves or improves oxygen consumption by the body. (Maniazhagu, Robert Alexander, Sukumar Sha, 2011) Aerobic metabolism plays a vital role in human performance and is basic to all sports, if for no other reason than recovery. Metabolically, the Krebs cycle and electron transport chain are the main pathways in energy production. (Baljit Singh Sekhon, Maniazhagu, 2018a). Aerobic exercise is the keystone of fitness by doing aerobics it increases the capillary network in the body. (Baljit Singh Sekhon, Maniazhagu, 2018b). 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 some degree in the maintenance of youthful fitness, thus helps slow down aging. During the aerobic activity, the pulse is taken after every dance piece to see if the desired heart rate is reached and maintained for a period of about 12 to 20 minutes. This will enable the heart to do the necessary workouts to increase its endurance and efficiency. (Oyco, 2002) Resistance exercises has value in the treatment of orthopedic injuries, low back pain, osteoporosis, overweight and obesity, sarcopenia (loss of skeletal muscle mass that may accompany aging), and diabetics mellitus. Moreover, resistance training may be helpful in reducing older person's susceptibility to falls. Weight training has also been shown to attenuate the rate-pressure product when any given load is lifted. (Graves and Franklin, 2001).

METHODOLOGY:

The study was formulated as pre and post test random group design, in which sixty subject were divided into four equal groups. The experimental group-1 (n=15, AD) underwent aerobic dancing the experimental group-2 (n=15, RT) underwent resistance training, experimental group-3 (n=15, AD+RT) underwent combined training of aerobic dancing and resistance training and group-4 (n=15, CG) served as a control group, they did not undergo any training. The resting pulse rate was chosen as dependent variable. It was tested by number of beats per minute recorded in numbers. The selected three treatment groups were performed twelve weeks, as per the stipulated training program. The condition of resting pulse rate was tested before and after the training period.

RESULTS

The result of the study is presented in the following Tables:

Table I
The Results Of Analysis Of Covariance On Resting Pulse Rate Of Different Groups

(Score in beats/minute)

Test Conditions	Grou p AD	Grou p RT	Grou p (AT+ RT)	Grou p CG	SV	SS	Df	MS	'F' Ratio	
Pre test	Mean	100.20	100.13	100.07	100.13	B	0.18	3	0.06	0.02
	S.D.	1.93	1.60	1.71	1.66	W	167.47	56	2.99	
Post test	Mean	95.13	98.27	95.07	101.73	B	450.32	3	150.11	76.05*
	S.D.	1.19	1.62	1.16	1.58	W	110.53	56	1.97	
Adjusted post test	Mean	95.10	98.28	95.13	101.70	B	444.08	3	148.03	397.41*
						W	20.49	55	0.37	

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

The pre test mean and standard deviation on resting pulse rate scores G1, G2 G3 and G4 were 100.20±1.93, 100.13±1.60, 100.07±1.71 and 100.13±1.66 respectively. The obtained pre test F value of 0.02 was lesser than the required table F value 2.77. Hence the pre test means value of aerobic dancing; resistance training, combined training and control group on resting pulse rate on before start of the respective treatments were found to be insignificant at 0.05 level of confidence for the degrees of freedom 3 and 56. Thus this analysis confirmed that the random assignment of subjects into four groups were successful. The post test mean and standard deviation on resting pulse rate of G1, G2 G3 and G4 were 95.13±1.19, 98.27±1.62, 95.07±1.16 and 101.73±1.58 respectively. The obtained post test F value of 76.05 was higher than the required table F value of 2.77. Hence the post test means value of aerobic dancing; resistance training, combined training

and control group on resting pulse rate on after the treatments were found to be significant at 0.05 level of confidence for the degrees of freedom 3 and 56. The results proved that the selected three training interventions namely aerobic dancing; resistance training and combined training were produced significantly decreased among the treatment group. The adjusted post test means on resting pulse rate scores of G1, G2 G3 and G4 were 95.10, 98.28, 95.13 and 101.70 respectively. The obtained adjusted post test F value of 397.41 was higher than the required table F value of 2.77. Hence adjusted post test means value of aerobic dancing; resistance training, combined training and control group on resting pulse rate were found to be significant at 0.05 level of confidence for the degrees of freedom 3 and 55. The results confirm that the selected three training interventions namely aerobic dancing; resistance training, and combined training on resting pulse rate were significantly decreased.

Table II
The Results Of Scheffe's Post Hoc Test Mean Differences On Resting Pulse Rate Among Three Groups (scores In Beats/minute)

Group 1 AD	Group 2 RT	Group 3 AD+RT	Group 4 C G	Mean Differences	Confidence Interval Value
95.10	98.28	-	-	3.18*	0.79
95.10	-	95.13	-	0.03	0.79
95.10	-	-	101.70	6.60*	0.79
-	98.28	95.13	-	3.15*	0.79
-	98.28	-	101.70	3.42*	0.79
-	-	95.13	101.70	6.57*	0.79

* Significant at .05 level of confidence.

The table II shows the paired mean differences of aerobic dancing; resistance training, combined training and control group on resting pulse rate.

The paired mean difference between aerobic dancing and resistance training, aerobic dancing and control group, resistance training and combined training, resistance training and control group, combined training and control group showed 3.8, 6.60, 3.15, 3.42, and 6.57 respectively. These values are higher than the confidential interval value of 0.79. Hence, it is noticed that pair wise comparisons of above groups were produced significantly different effect on resting pulse rate. The paired mean difference between aerobic dancing and combined group was 0.03 which is lower than the confidential interval value of 0.79. Hence, this comparison was insignificant. Both the training groups produced similar effect on resting pulse rate.

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. Derek Kingsley and Arturo Figueroa (2014) found that the An acute bout of upper-, lower- or whole-body resistance exercise may cause a prolonged decrease in vagal modulation in young healthy adults. RT appears to have no negative or positive effects on resting cardiac autonomic modulation. Deuk-Ja Oh, Hyeon-Ok Hong, and Bo-Ae Lee (2016) found that the exercises induced the positive alteration on resting heart rate, blood pressure, and maximal oxygen uptake. Patricia A. Gillett and Patricia A. Eisenman (1987) suggest that the cardiovascular fitness changes for overweight, middle-aged women are greater when exercise intensity and progression are tailored to their age and fitness level. Seol-Jung Kang, Eon-ho Kim and Kwang-Jun Ko (2016) conclude that aerobic exercise had beneficial effects on the resting heart rate, physical fitness, and arterial stiffness of patients with metabolic syndrome. Cornelissen, Verheyden, Aubert and Fagar (2009) found that in participants at higher age, both training programmes exert similar effects on SBP at rest, during exercise and during post-exercise recovery, whereas the effects on HR are more pronounced after higher intensity training.

CONCLUSIONS

The results of this study indicate that the selected three training interventions namely aerobic training, resistance training and combined training would produce significantly decreased on resting pulse rate to the type 2 diabetic patients. However the combined training had influenced greater development of resting pulse rate. Further aerobic training has produced the significant development in the value of resting pulse rate than the resistance training. The least

development was observed in the resistance training on resting pulse rate than the control group. No development was observed in resting pulse rate on control group.

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