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EFFECT OF YOGA AND BRISK WALKING ON RESTING PULSE RATE OF NON-INSULIN DEPENDENT DIABETIC PATIENTS

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ABSTRACT

The purpose of the study was to find out the effect of yoga and brisk walking on selected physiological variables of Non Insulin Dependent Diabetic Patients. For this purpose, Forty five (N=45) aged between 35 to 45 years working men in a private company at Hosur, Tamilnadu, India were randomly selected as subjects. The training programme was designed for 12 weeks and Experimental group I (n=15) underwent Yoga practices, Experimental group II (n=15) underwent brisk walking for 5 days per week for 12 weeks, group III acted as Control group, they were not allowed to not involve any type of physical activities. Yoga and brisk walking were selected as Independent variables. Resting pulse rate was selected as dependent variables. Pre test and Post test were conducted on selected physiological variables. The collected data were analysed by using Dependent 't - test' Analysis of covariance (ANCOVA) was applied to find out the effect of Yoga and brisk walking on resting pulse rate and scheffe's Post hoc method was used for testing the significance between paired adjusted means. The level of significance was 0.05. The results of the study indicated that the the effect of yoga and brisk walking training had significantly improved the resting pulse rate of Non Insulin Dependent Diabetic Patients.

KEYWORDS: Yoga, Brisk walking,, resting pulse rate, NIDDM,ANACOVA.

INTRODUCTION

Diabetes is a condition where the body fails to utilize the ingested glucose properly. This could be due to lack of the hormone insulin or because the insulin that is available is not working effectively.**(Dr. Ananya Mandal, MD)**

Yoga means the experience of oneness or unity with inner being. This unity comes afterdissolving the duality of mind and matter into supreme reality. It is a science by which the individual approaches truth. The aim of all yoga practice is to achieve truth where the individual soul identifies itself with the supreme soul or God. Yoga has the surest remedies for man's physical as well as psychological ailments. It makes the organs of the body active in their functioning and has good effect on internal functioning of the human body. Yoga is a re-education of one's mental process, along with the physical. The stages of yoga are eight,*Yama, Niyama, Pranayama, Pratyahara, Dharana, Dhyana*and*Samathi*, they are allintegrated **(Iyangar, B.K.S. 1999).**

Walking also called ambulation is the main form of animal locomotion on land,distinguished from running and crawling. When carried out in shallow waters, it is usually described as wading and when performed over a steeply rising object or an obstacle it becomes scrambling or climbing. The word walk is descended from the Old English wealcan "to roll".Brisk walking is the walking for 4 miles per hour of pace. It should not be too slow or too fast.

Heart rate, or pulse, refers to the number of times the heart beats per minute. Resting heart rate refers to the heart pumping the lowest amount of blood needed. The resting heart rate for most individuals is usually between 60 and 100 beats per minute. The most prominent spots wherein one can feel the pulse without much difficulty are Physiological spots, where pulse rate of heart's rhythmic tone can be ascertained which are wrist, inside of the elbow, Behind the neck and Ankle joint.**(Zensorium.com 2015)**

The more you workout the lower your resting pulse is, and the lower your resting pulse is, the less hard your heart has to work. The best way to think about is to view your heart as a muscle, and the more you work it, the stronger it gets. A stronger heart means more blood with each beat, and the same amount of work can be done with fewer beats. If your heart needs more beats to do the same amount of work, over time this can lead to cardiovascular disease and/or heart attacks (**Benson,R.&Connoly,D 2011).**

METHODOLOGY

Forty five (N=45) Non -Insulin dependent diabetic patients working in private companies in Hosur, krishnagiri district, Tamil Nadu, India, were selected as subjects. The selected subjects were divided into three equal groups of fifteen each namely Experimental group I underwent yogic practices, Experimental group II underwent brisk walking for 5 days per week for 12 weeks and Experimental group III acted as control group. The age group of the subjects ranged from 35 to 45 years. However all the three groups were advised to continue the medicines as per the recommendations of their doctors (Physicians). Resting pulse rate was selected as physiological variables. The Experimental group I (Yoga) includes Loosening exercise, Surya Namaskar, Asana, Pranayama, Meditation and Yoga nidra. Experimental group II (Brisk walk) underwent brisk walk for 45 minutes continuously without any rest Control Group had no special training.

Statistical Analysis

The collected data were analysed by using Dependent 't - test' Analysis of covariance (ANCOVA) was applied to find out the effect of Yoga and brisk walking on selected physiological variables and scheffe's Post hoc method was used for testing the significance between paired adjusted means. The level of significance was 0.05.

TABLE – I

THE SUMMARY OF MEAN AND DEPENDENT't' TEST FOR THE PRE AND POST ON RESTING PULSE RATE

(Scores in beats/minute)

Mean	Experimental Group I (Yoga)	Experimental Group II (Brisk Walking)	Control group
Pre test mean	76.80	78.07	77.27
SD	4.74	3.28	6.35
Post test mean	72.93	71.27	76.13
SD	3.49	3.88	3.87
Mean difference	2.42	6.80	1.13
't' ratio	6.20*	15.90*	0.94

**Significant at 0.05 level of confidence.*

(*Table value required for significance at 0.05 level for ' t' test with d f14 is =2.15)*

Table-V shows the mean, standard deviation and mean difference values of the pre and post test data collected from the experimental and control groups on Resting pulse rate. Further, the collected data was statistically analyzed by dependent 't' test to find out the significant differences if any between the pre and post data. The obtained 't' values of Experimental group I, Experimental Group II and Control group are 6.20, 15.90 and 0.94 respectively which are greater than the required table value of 2.15 with df 14 at 0.05 level of confidence. It revealed that significant differences exist between the pre and post test means of experimental groups on Resting pulse rate.

The Analysis of covariance on Resting pulse rate of experimental and control groups has been presented in table II

Table – II
COMPUTAION OF ANALYSIS OF COVARIANCE ON RESTING PULSE RATE
(Scores in beats/minute)

Adjusted Post-test Means			Source of Variance	Sum of Squares	Df	Mean squares	'F' ratio
Experimental Group I (Yoga)	Experimental Group II (Brisk Walking)	Control Group					
73.27	70.87	76.20	B	213.054	2	106.527	17.95*
			W	243.34	41	5.935	

**Significant at 0.05 level of confidence*
(*Table value required for significance at 0.05 level with 2& 41 is 3.23)*

Table-II shows that the adjusted post-test mean values of Resting pulse rate for Experimental group I, Experimental Group II and Control group are 73.27, 70.87 and 76.20 respectively. The obtained 'F' value of 17.95 on Resting pulse rate was greater than the required table value of 3.23 of 2, 42 df at 0.05 level of confidence. Hence, it was concluded that significant reduction exists between the adjusted post-test means of Yoga, Brisk walking and Control group on Resting pulse rate.

Since, the obtained 'F' value in the adjusted post test means is found to be significant, the Scheffe's test is applied as post hoc test to find out the paired mean difference, and it is presented in Table-III.

Table -III
THE SCHEFFE'S POST HOC TEST FOR THE DIFFERENCES BETWEEN THE ADJUSTED POST-TEST PAIRED MEANS OF RESTING PULSE RATE
(Scores in beats/minute)

Experimental Group I (Yoga)	Experimental Group II (Brisk Walking)	Control Group	Mean Difference	Confidence Interval
73.27	70.87		2.40*	2.26
73.27		76.20	2.93*	2.26
	70.87	76.20	5.33*	2.26

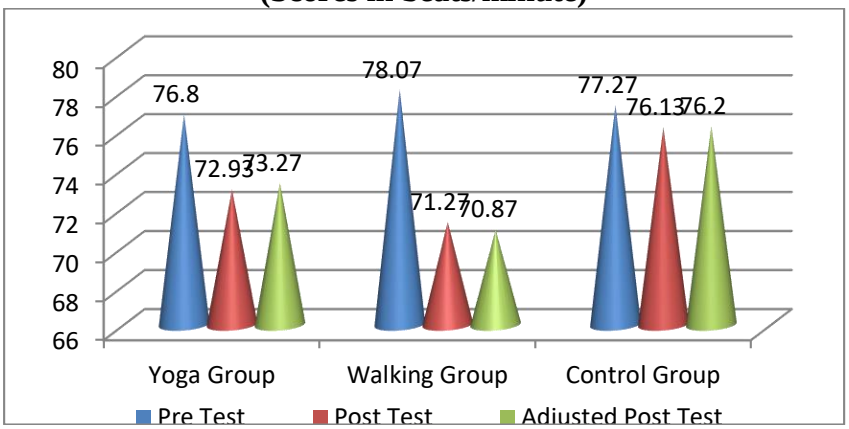
**Significant at 0 .05 level of confidence*

Table III shows that the adjusted post-test mean differences on Experimental group I and Experimental group II, Experimental group I and Control group, Experimental group II and Control group are 2.40, 2.93 and 5.33 respectively and they are greater than the confidence internal value 2.26 which shows significant difference at 0.05 level of confidence.

The result of the study further reveals that there is significant difference on the Resting pulse rate between he adjusted post-test means of Experimental group I, Experimental group II and Control group.

However, the decrease in Resting pulse rate is significant for Experimental group II (Brisk Walking) than Experimental group I (Yoga). It may be concluded that the experimental group II (Brisk walking) has established better reduction than the Experimental group I (Yoga) in reducing the Resting pulse rate. The pre-test, post-test and adjusted post-test mean values of Experimental and Control group on Resting pulse rate are graphically represented in the figure.1

FIGURE –1
PRE-TEST, POST-TEST AND ADJUSTED POST TEST MEAN VALUES OF EXPERIMENTAL AND CONTROL GROUPS OF RESTING PULSE RATE
(Scores in beats/minute)



Discussion on the findings of Resting Pulse Rate

The Analysis of Co-variance of Resting pulse rate included that Experimental group I (Yoga) and Experimental group II (Brisk Walking) significantly improved in pulse rate. It may be due to the effect of yoga and Brisk walking on selected physiological, bio-chemical and psychological variables of Non-insulin dependent Diabetic Patients.

Further the findings of this study showed that the experimental group II (Brisk Walking) was significantly better than group I (Yoga) in decreasing the Resting pulse rate. However the control group did not produce any improvement on Resting pulse rate.

Shaver (1982) stated that due to endurance training, the thickness of the ventricular wall remains normal, the size (Volume) of the ventricular cavity of the heart becomes large which means that it is able to hold more blood during the resting or diastolic period. The thickness of the ventricular wall increases while the size remains normal. As training progress, this results not only in a slower heart rate for a standard submaximal work load, but also in a slower resting pulse rate (brdycardia) and a slight decrease in maximal heart rate. The increased size of the heart causes stroke volume and cardiac output while beating less frequently allows a larger blood flow to reach the muscles with less stress imposed on the heart, lungs and vascular systems. For stroke and maximal exercise values are increased. In the case of cardiac output, maximal cardiac output is increased, however, for rest and standard submaximal work load, cardiac output is not significantly changed. Since cardiac output for the trained and untrained person are about the same during rest and sub maximal work, it is obvious that the trained person is able to accomplish his or her cardiac output at a much lower heart rate.

CONCLUSION

1. In Resting pulse rate, the Experimental Group II (Brisk Walking) exhibited significant reduction than Experimental Group I (Yoga). Hence experimental group II was significantly better than experimental group I.

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