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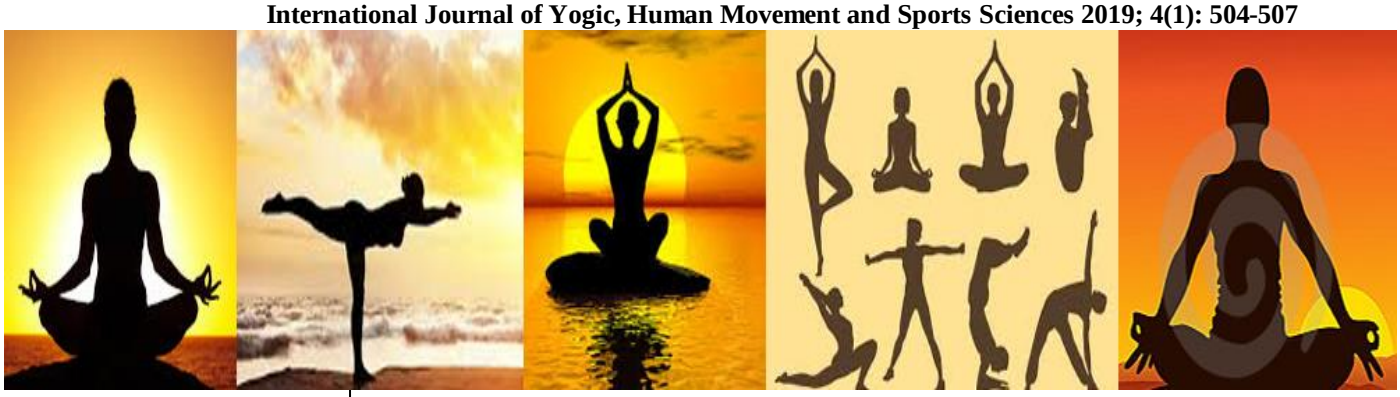

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Effect of yogic practices on physiological biochemical & psychological variables among type ii diabetes mellitus

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Abstract
The purpose of the study was to investigate the effect of yogic practices on physiological, biochemical and psychological variables among type II Diabetes mellitus persons. To achieve the purpose of the present study, 40 diabetes mellitus persons were selected as subjects and their ages ranged from 40 to 45 years. The analysis of variance was used to analyze the data of the control and experimental groups, between the stages, namely pretest and posttest. Statistical computation as mentioned by Clarke and Clarke was used. The groups were selected at random and not equated in any way in relation to the variables selected for the study. The level of significance to the T-ratio, obtained by the analysis of variance was fixed at 0.5 level of confidence, which was considered to be appropriate in view of the fact that highly sophisticated equipments were not used for more stringent level of significance. The results of the study reveal that there was significant change in blood glucose, HDL, BP and stress levels of experimental group as compared to control group after completion of the training period.

Keywords: Yogic practices, physiological, biochemical & psychological variables, type ii diabetes mellitus

Introduction
Asanas are beneficial in treatment of diabetes, BP and stress. Due to various twists, stretches and strains in the body, the internal organs are stretched and subjected to strain. This increases the blood supply, oxygen supply to the organs increasing the efficiency and functioning of the organ, stretching various glands result in increased efficiency of the endocrine system. Asanas like Dhanurasana, Ardhamatsyendrasana, Trikonasana, Bhujangasana, Sarvangasana, Dandasana, Matsyasana have been found useful in diabetes. These asanas have positive effect on pancreas and insulin functioning. But to get the result one needs to maintain the asana for longer duration while relaxing the muscles. Proper yogic methods will keep majority of symptoms of diabetes in control. Insulin injection is required for patients whose endogenous insulin secretion is deficient due or insufficient due to destruction of beta cells of Islets of Langerhans. In yogic treatment consisting of relax active asanas and the advice to change the outlook in only day-to-day life bring about control of blood sugar.

Healthy diet and adequate exercise are important in preventing Type II diabetes in childhood as well as obesity. Diabetes is a metabolic disease in which the body cannot properly metabolize (break down) the sugars from food. Because the body cannot metabolize sugars, the sugars accumulate in the bloodstream instead and ultimately stress children's kidneys, heart, circulatory system, and eyes. Insulin, which is created in the pancreas, is the chemical that breaks down breaks down blood sugar. In Type II diabetes, the body does not produce enough insulin to deal with all the sugars coming into the body. This medical diagnosis used to be called "adult-onset diabetes" because the disorder primarily affected adults with poor eating and activity habits. Today, however, however, this illness is now diagnosed in America's children far more than in adults. It is now referred to as "Type II diabetes", to reflect this shift in prevalence.

Diabetes Mellitus is a disease related to the impaired glucose tolerance of the body, insulin functioning is affected. Symptoms of diabetes can be excessive thirst, excessive hunger or excessive / frequent urination. Diabetes Mellitus can be of Type 1 or Type 2 or pancreatic diabetes or gestational diabetes.

Type 1 diabetes is caused by No production of insulin and this is very difficult to treat with Yoga. Type 2 diabetes which is caused by life style, stress related diseases can be effectively treated with Yoga. Sun Salutation - Sun Salutation is very good exercise for people suffering from diabetes, it increases the blood supply to various parts in the body, improving insulin administration in the body, it gives all the benefits of exercise if practiced at four rounds per minute. If practiced at slow speed, it offers the benefits of asanas.

Methodology

Selection of subjects

To achieve the purpose of the present study, 40 diabetes mellitus persons were selected as subjects at random and their ages ranged from 40 to 45 years. The subjects were divided into two equal groups.

Selection of variables

The subjects were tested on the selected Biochemical parameters at the beginning(Pre-test)and at the end of the experimental period (Post-Test).

Physiological

1. BP (Systolic & Dystolic)
2. HDL

Biochemical

1. Blood glucose level

Psychological

1. BP

Blood Pressure Stage	Systolic	Dystolic
Normal	< 120	< 80
Pre-Hypertension	120 - 139	80 - 99
Stage-I Hypertension	140 - 159	90 - 99
Stage-II Hypertension	160 +	100 +

The B.P test has been conducted using the BP Apparatus, calibrated properly

2. HDL

This is referred to as "good" cholesterol, because it helps to remove LDL Cholesterol from the blood.
The acceptable HDL range is > 40 to 60 mg/dL

3. Blood Glucose Level

Normally the fasting level of Blood Glucose is < 90 mg/dL. After two hours Post Prandial level is < 120 mg/dL. If 150 and 200 mf/dL, condition is labeled as impaired tolerance, if it is > 200 mf/dL, it is frank diabetes.

4. Stress

Stress has been measured using the Standard Stress Questionnaire. If the result ranged > 4 points, the person may be under significant stress.

Administration of training programs

To achieve the purpose of the present study, training programs for experimental group were designed separately. The scientifically designed programmes were given to the subjects of experimental group. The subjects of the control group were not participated in training.

Analysis and interpretation of data

The analysis of variance was used to analyze the data of the control and experimental groups, between the stages, namely pretest and posttest.

Blood Glucose Test

Table 1: Analysis of covariance of data on blood glucose levels between pre-tests and post-tests of experimental and control group

Group	Period	Mean	S.D	T-Ratio
Experimental Group	Pre test	116.5	4.36	10.5
	Post test	102.6	4.04	
Control Group	Pre test	130.8	15.58	0.25
	Post test	132.1	15.5	

Significant at 0.05 level of confidence (The table values required for significance at 0.05 level of confidence for 18 is 2.10.

Table 2: Analysis of covariance of Data on Blood Glucose Levels between Pre-tests of Experimental and Control Group

Group	Period	Mean	S.D	T-Ratio
Experimental Group	Pre test	116.5	4.36	
Control Group	Pre test	130.8	15.58	4.0

Significant at 0.05 level of confidence (The table values required for significance at 0.05 level of confidence for 18 is 2.10)

Table 3: Analysis of covariance of Data on Blood Glucose Levels between Post- tests of Experimental and Control Group

Group	Period	Mean	S.D	T-ratio
Experimental	Post test	102.65	4.04	8.2
Control	Post test	132.05	15.5	

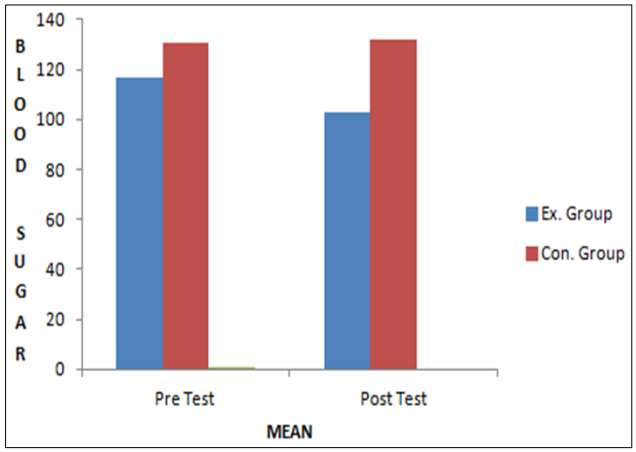

Fig 1: Significant at 0.05 level of confidence (The table values required for significance at 0.05 level of confidence for 18 is 2.10)

The table shows that the pre-test and post-test mean values on blood glucose level for experimental and control groups were 116.5, 102.65 and 130.85, 132.05 respectively and also the pretest and post-test standard deviation values on blood glucose level for experimental and controlled groups were 4.36, 4.04 and 15.58,15.5 respectively. The obtained T-Ratio value was 10.5 for experimental group. This obtained T-ratio value 10.5 on blood glucose level which was greater than the required table value 2.10 for insignificance with df is 18.The degree of freedom was 18 for experimental and control group.

HDL Analysis

Table 1: Analysis of covariance of Data on H.D.L (High-density lipoprotein) between Pre-tests and Post-tests of Experimental and Control Group

Group	Period	Mean	S.D	T-Ratio
Experimental Group	Pre test	30	13.27	4.59
	Post test	48.5	12.27	
Control Group	Pre test	30.5	10.62	0.22
	Post test	29.75	10.69	

Significant at 0.05 level of confidence (The table values required for significance at 0.05 level of confidence for 18 is 2.10)

Table 2: Analysis of covariance of Data on H.D.L (High-density lipoprotein) Pre-test of Experimental and Control Group

Group	Period	Mean	S.D	T-Ratio
Experimental Group	Pre test	30	13.27	0.13
Control Group	Pre test	30.5	10.62	

Significant at 0.05 level of confidence (The Table values required for significance at 0.05 level of confidence for 18 is 2.10

Table 3: Analysis of covariance of Data on H.D.L (High-density lipoprotein) Post-test of Experimental and Control Group

Group	Period	Mean	S.D	T-ratio
Experimental	Post test	48.5	12.27	5.2
Control	Post test	29.75	10.69	

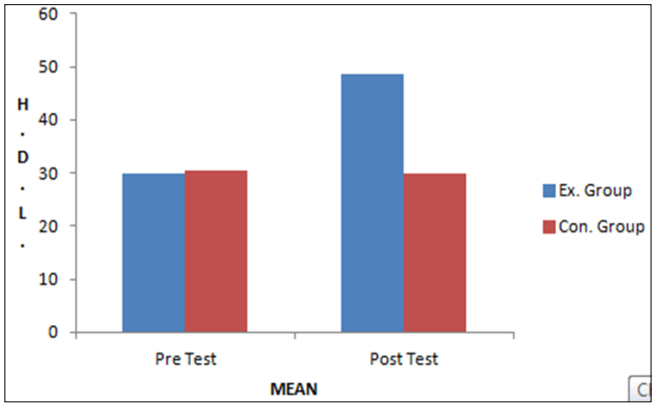

Fig 2: Significant at 0.05 level of confidence (The table values required for significance at 0.05 level of confidence for 18 is 2.10)

The table shows that the pretest and posttest mean values on High-density lipoprotein values for experimental and control groups were 30, 48.5 and 30.5, 29.75 respectively and also the pretest and posttest standard deviation values on High-density lipoprotein level for experimental and controlled groups were 13.27, 12.27 and 10.62, 10.69 respectively. The obtained T-Ratio value was 4.59 for experimental group. This obtained T-ratio value 4.59 on High-density lipoprotein level which was greater than the required table value 2.10 for insignificance with df is 18.The degree of freedom was 18 for experimental and control group.

Blood pressure test

Table 1: Analysis of covariance of Data on Blood Pressure (systolic). Between Pretest and Posttests of Experimental and Control Group

Group	Period	Mean	S.D	T-Ratio
Experimental Group	Pre test	158	26.28	2.11
	Post test	142.8	19.59	
Control Group	Pre test	149.3	22.38	0.26
	Post test	151	19.64	

Significant at 0.05 level of confidence (The table values required for Significance at 0.05 level of confidence for 18 is 2.10)

Table-2 Analysis of covariance of Data on Blood Pressure (Systolic) for pre-test of Experimental and Control Group significance at 0.05 level of confidence for 18 is 2.10

Group	Period	Mean	S.D	T-Ratio
Experimental Group	Pre test	158	26.28	1.13
Control Group	Pre test	149.3	22.38	

Significant at 0.05 level of confidence (The Table values required for significance at 0.05 level of confidence for 18 is 2.10

Table 3: Analysis of covariance of Data on Blood Pressure (Systolic) for Posttest of Experimental and Control Group

Group	Period	Mean	S.D	T-ratio
Experimental	Post test	141.25	19.59	1.6
Control	Post test	151.25	19.64	

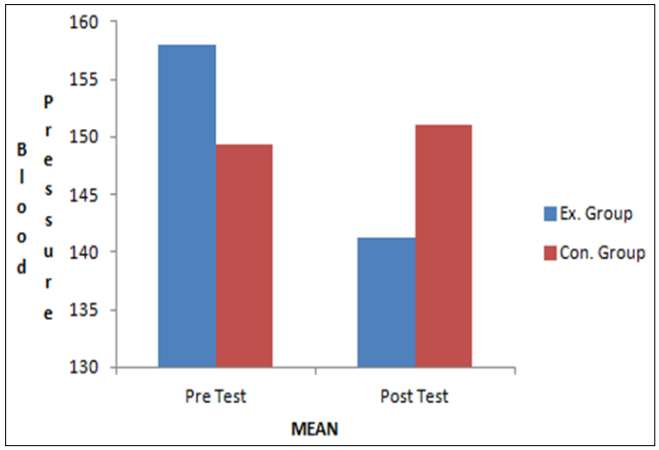

Fig 3: Significant at 0.05 level of confidence (The table values required for significance at 0.05 level of confidence for 18 is 2.10

The table shows that the pretest and posttest mean values on blood Pressure (systolic) for experimental and control groups were 158, 141.25 and 149.3, 151 respectively and also the pretest and posttest standard deviation values on blood Pressure (systolic) for experimental and controlled groups were 26.28, 19.59 and 22.38, 19.64 respectively. The obtained T-Ratio value was 2.11 for experimental group. This obtained T-ratio value 2.1 on blood pressure level which was greater than the required table value 2.10 for insignificance with df is 18.The degree of freedom was 18 for experimental and control group.

Stress Analysis

Table 1: Analysis of covariance of Data on Stress Levels between Pretests and Posttests of Experimental and Control Group.

Group	Period	Mean	S.D	T-Ratio
Experimental Group	Pre test	6.55	0.94	10.6
	Post test	3.8	0.77	
Control Group	Pre test	6.4	1.1	0.33
	Post test	6.3	0.73	

Significant at 0.05 level of confidence (The table values required for significance at 0.05 level of confidence for 18 is 2.10)

Table 2: Analysis of covariance of Data on Stress Levels between Pretests of Experimental and Control Group

Group	Period	Mean	S.D	T-Ratio
Experimental Group	Pre test	6.55	0.94	0.47
Control Group	Pre test	6.4	1.1	

Significant at 0.05 level of confidence (The Table values required for Significance at 0.05 level of confidence for 18 is 2.10)

Table 3: Analysis of covariance of Data on Blood Glucose Levels between Posttests of Experimental and Control Group

Group	Period	Mean	S.D	T-ratio
Experimental Control	Post test	3.8	0.77	10.42
	Post test	6.3	0.73	

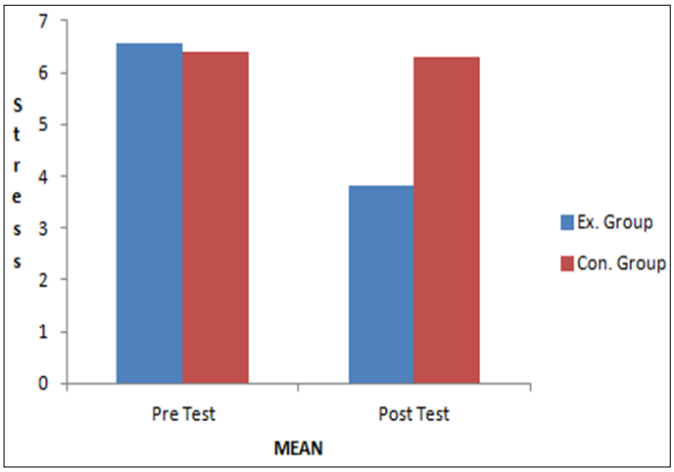

Fig 3: Significant at 0.05 level of confidence (The table values required for significance at 0.05 level of confidence for 18 is 2.10)

The table shows that the pretest and posttest mean values on Stress level for experimental and control groups were 6.55, 3.8 and 6.4, 6.3 respectively and also the pretest and posttest standard deviation values on Stress level for experimental and controlled groups were 0.94, 0.77 and 1.1, 0.73 respectively. The obtained T-Ratio value was 10.6 for experimental group. This obtained T-ratio value 10.6 on Stress level which was greater than the required table value 2.10 for insignificance with df is 18.The degree of freedom was 18 for experimental and control group.

Discussion and Findings

The results of the study reveal that there was significant change in blood glucose, HDL, BP and stress levels of experimental group as compared to control group after completion of the training period.

Discussion on Hypothesis

The researcher had formulated the following hypothesis as earlier. At first it was hypothesized that there would be a significant reduction in blood glucose, HDL, BP and stress levels in Yoga group as compared to control group after completion of the training period. The result of the study showed that there was significant reduction on blood glucose, BP, stress levels and increase in HDL due to yoga training, hence the researcher's hypothesis was accepted.

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