ABSTRACT OF THESIS

The educational institutions are the temple of learning, where two factors are involved: the teacher and the taught. The duty of the teacher is to teach and that of the taught to learn. To facilitate the teaching learning process, there should be harmony and co-operation between the teacher and learner. By gently shaping and toning the body yoga exercises improve posture and flexibility which make feel of well-being. There exercises have deep effect for better circulation especially for extremities. It maintains the elasticity of blood vessels. Also, in some cases, it reduces high blood pressure with the combination of relaxation training. At the time of observation the practice teaching of our students in the secondary schools of Amravati district, in Maharashtra it was observed that some of the secondary school teachers of that locality were not participating in any other co-curricular activity of their school except their allotted classes; even they were less interested in their assignment for teaching. They preferred to remain inactive in the staff room and some time they used to go back to their residence before school hours completed, they were not feeling well. After discussion with them it was revealed that they were suffering from diabetes. Keeping in mind the aforesaid facts it was planned to subject such patients to undertake selected yoga exercise with a view to see whether the maladies o the type II diabetes could be controlled or removed without conventional therapeutic treatment with medicines. The positive results of the experiment might be helpful in case of Type II diabetic patient teachers to perform their responsibilities as a teacher more effectively and efficiently.

This experiment was an attempt to examine the improvement of the condition of the diabetic patient teachers that could be affected through the administration of selected yoga exercises. In other words it was a study to find out to what extent functional improvement could be achieved through yoga exercises in order to rehabilitate the diabetic patient teachers so as to restore them to normal condition of health as that as their fellow teachers.

Among the diabetic patient teachers of secondary school in the urban area of Amravati district of Maharashtra, only 64 (Sixty four) willing mellitus type II diabetic teachers both male and female were sorted out as the subject of this experimental study. It was done in consultation with the doctors of the patient teachers. The Headmasters/Headmistress of the concerned schools and the District Sports and Education Officer extended their hand to conduct the experiment. The environmental conditions, daily routine work of the subjects were same as those of the 32 (thirty
two) non-diabetic teachers included as the subjects of the experiment. Their age range varied from 35 (Thirty five) to 58 years. The experiment was carried out on 96 (ninety six) subjects [44 (forty four) male mellitus type II diabetic and 20 (twenty) female mellitus type II diabetic teachers and 22 (twenty) non-diabetic male teachers and 10 (ten) non-diabetic female teachers]. The diabetic and non-diabetic teachers were sorted out from the same secondary schools. The subjects were divided in groups of three on the basis of age, sex, severity of illness and attempts were made to maintain homogeneity in grouping as far as it was possible.

The groups were as under:

**GROUP-A:** For yoga exercises consisting of 22 (Twenty Two) male and 10 (Ten) female teacher.

**GROUP-B:** For control group consisting of 22 (Twenty Two) male and 10 (Ten) female teacher.

**GROUP-C:** For non-diabetic group consisting of 22 (Twenty Two) male and 10 (Ten) female teacher.

The treatment program was conducted at the district sports office complex of Amravati district, Maharashtra, as the subjects were residing in the nearest place of the therapeutic treatment center. Among the diabetic teachers 32 (22 male and 10 female) who had undergone the following yoga exercises: Janushirasana, Ardha-Matseyendrasana, Purna Salbhasana, Halasana, Ustrasana, Dhabnurasana, Bhujangasana, Paschimotanasana, Sarvangasana s and Shavasana for 6 (six) days a week for 45 (forty five) minutes each day for a period of 24 weeks under direct supervision of the experimenter. All the subjects were directed not to take any medicine, special food during the experimental period.

The data on selected parameters of organic disorders namely; Amount of sugar in blood, Amount sugar in urine, WBC count, RBC count and Body weight, were tested and measured before and after 24 weeks of treatment programme with the help of a doctor. The records of measurements were kept about their initial and final scores produced in their aforesaid organic disorders.

To find out the teaching effectiveness namely; Regularity, Interest in teaching, Participation in co-curricular activities, Co-operative attitude, Professional attitude, Teacher
pupil relationship, the questionnaires were finally designed for the Headmasters/Headmistress and the students in concentration with the supervisors and eminent experts in the field of education and physical education. The questionnaires were divided into 6 (six) dimensions and each dimension consisted of 6 (six) statements and it was administered to 32 (thirty two) Headmasters/Headmistress and 192 (one hundred ninety two), (3 students of std. IX 3 students of std. X from each school) students randomly selected from 32 (thirty two) secondary schools in the urban area of Amravati district, Maharashtra. Finally the information's were collected in 192 (one hundred ninety two) questionnaires from 32 (thirty two) Headmasters/Headmistress and 1152 questionnaires from 192 students before and after 24 weeks of treatment programme to compare the teaching effectiveness of the subjects.

**INTERPRETATIONS:**

To find out the effect of prescribed yoga exercise (Asanas) on organic disorders of the subjects, ‘t’ test were employed to determine the significant mean differences between the initial and final scores and X² (Che-Square) were employed to compare the percentage of urine sugar for three groups and to compare the teaching effectiveness X² as well as percentage statistical techniques were employed independently. The level of significance was set at .05 levels

**Organic disorders: Blood Sugar (Fasting):**

In case of male subjects the differences between the initial and final means of yoga exercise group was significant at .05 level (reference table 04), as the calculated 't' value of 3.99 was higher than the tabulated 't' .05 (21) value of 2.08, but no significant improvements were found of control group and non-diabetic group in case of blood sugar (Fasting), as the calculated 't' value of 0.61 and 0.04 respectively were less than the tabulated 't' .05 (21) level. Then, it might be concluded that the yoga exercise group shown significant improvement on blood sugar (fasting) over the control group and non-diabetic group.

In case of female subjects the differences between the initial and final means of yoga exercise group was significant at .05 level (reference table no.20), as the calculated 't' value of 3.91 was higher than the tabulated 't' .05 (9) value of 2.26, but no significant improvements were found of control group and non-diabetic group in case of blood sugar (fasting), as the calculated 't' value of 0.33 and 0.13 respectively were less than the tabulated 't' .05 (9) level. Then, it might
be concluded that the yoga exercise group shown significant improvement on blood sugar (fasting) over the control group and non-diabetic group.

**Blood Sugar (Postprandial):**

In case of male subjects the differences between the initial and final means of yoga exercise group was significant at .05 level (reference table no.02), as the calculated ‘t’ value of 4.19 was higher than the tabulated ‘t’ .05 (21) value of 2.08, but no significant improvements were found of control group and non-diabetic group in case of blood sugar (Postprandial) as the calculated ‘t’ value of 1.27 and 0.87 respectively were less than the tabulated ‘t’ .05 level. Then it might be concluded that the yoga exercise group shown significant improvement on blood sugar (Postprandial) over the control group and non-diabetic group.

In case of female subjects the differences between the initial and final means of yoga exercise group was significant at .05 level (reference table no.21), as the calculated ‘t’ value of 3.09 was higher than the tabulated ‘t’ .05 (9) value of 2.26, but no significant improvements were found of control group and non-diabetic group in case of blood sugar (Postprandial), as the calculated ‘t’ value of 0.74 and 0.48 respectively were less than the tabulated ‘t’ .05 (9) level. Then it might be concluded that yoga exercise group shown significant improvement on blood sugar (Postprandial) over the control group and non-diabetic group.

**Urine Sugar (Fasting):**

In case of male subjects the difference between initial and final scores of yoga exercise group was significant at .05 level (reference table no.03), as the calculated value of X2 13.96 was higher than the tabulated X2 value at .05 (2) was 5.99, but no significant improvements were found of control group and non-diabetic group in case of urine sugar (fasting), as the calculated X2 values of 0.5 and 0.00 respectively were less than the tabulated X2 .05 (2) level. Then, it might be concluded that the yoga exercise group shown significant improvement on urine sugar fasting over the control group and non-diabetic group.

In case of female subjects the difference between initial and final scores of yoga exercise group was significant at .05 level (reference table no.22), as the calculated value of X2 23.58 was higher than the tabulated X2 value at .05(2) was 5.99, but no significant improvements were found of control group and non-diabetic group in case of urine sugar (fasting), as the calculated
X2 values of 0.0 and 0.00 respectively were less than the tabulated X2 .05 (2) level. Then, it might be concluded that the yoga exercise group shown significant improvement on urine sugar (fasting) over the control group and non-diabetic group.

**Urine Sugar (Postprandial):**

In case of male subjects the difference between initial and final scores of yoga exercise group was significant at .05 level (reference table no 04), as the calculated value of X2 19.98 was higher than the tabulated X2 value at .05(3) was 7.82, but no significant improvement were found of control group and non-diabetic group in case of urine sugar (postprandial), as the calculated X2 values of 6.84 and 0.00 respectively were less than the tabulated X2 .05 (3) level. Then, it might be concluded from the results that the yoga exercise group shown significant improvement on urine sugar(postprandial) over the control group and non-diabetic group.

In case of female subjects the difference between initial and final scores of yoga exercise group was significant at .05 level (reference table no.23), as the calculated value of X2 23.66 was higher than the tabulated X2 value at .05(3) was 7.82, but no significant improvements were found of control group and non-diabetic group in case of urine sugar (Postprandial), as the calculated X2 values of 5.32 and 0.00 respectively were less than the tabulated X2 .05 (2) level. Then, it might be concluded that the yoga exercise group shown significant improvement on urine sugar (postprandial) over the control group and non-diabetic group.

**W.B.C. or Leukocytes Count:**

In case of male subjects the differences between the initial and final means of three groups (Y.E.G, C.G. and N.D.G.) were not significant at .05 levels (reference table no.08). Then, it might be concluded that the effect of yoga exercises were insignificant on W.B.C. or Leukocyte count in case of three groups for male subjects.

In case of female subjects the differences between the initial and final means of three groups (Y.E.G., C.G. And N.D.G.) were not significant at .05 level (reference table no. 24 ), as the calculated 't' values were less than the tabulated 't' .05 (9) value of 2.26. Then, it might be concluded that the effect of yoga exercises were insignificant on W.B.C or Leukocyte count in case of three groups for female subjects.
**R.B.C. or Erythrocyte Count:**

In case of male subjects the differences between the initial and final means of three groups (Y.E.G., C.G. and N.D.G.) were not significant at .05 level (reference table no. 06), as the calculated 't' values were less than the tabulated 't' .05(21) value of 2.08. Then, it might be concluded that the effect of yoga exercises were insignificant on R.B.C. or erythrocyte count in case of three groups for male subjects.

In case of female subjects the differences between the initial and final means of three groups (Y.E.G., C.G. and N.D.G.) were not significant at .05 level (reference table no. 25), as the calculated 't' values were less than the tabulated 't' .05(9) value of 2.26. Then, it might be concluded that the effect of yoga exercises were insignificant on R.B.C. or erythrocyte count in case of three groups for female subjects.

**Body Weight:**

In case of male subjects the differences between the initial and final means of three groups (Y.E.G., C.G. and N.D.G.) were not significant at .05 level (reference table no 07), as the calculated ‘t’ values were less than the tabulated ‘t’ .05 (21) value of 2.08. Then, it might be concluded that the effect of yoga exercises were insignificant on body weight in case of three groups for male subjects.

In case of female subjects the differences between the initial and final means of three groups (Y.E.G., C.G. and N.D.G.) were not significant at .05 level (reference table no.26), as the calculated ‘t’ values were less than the tabulated ‘t’ .05 (9) value of 2.26. Then, it might be concluded that the effect of yoga exercises insignificant on body weight in case of three groups for female subjects.

**TEACHING EFFECTIVENESS (Experts Rating): Regularity:**

In case of male subjects the differences between the initial and final scores of Y.E.G. was significant at .05(1) level (reference table no.08), as the calculated value of X2 14.97 was higher than the tabulated X2 value of 3.84, but no significant improvements were found of control group and non-diabetic group in case of regularity, as the calculated value of X2 0.01 and 0.29 respectively were less than the tabulated X2 value of 3.84. Then, it might be concluded that the yoga exercise group shown significant improvement in regularity over the control group and
non-diabetic group.

In case of female subjects the differences between the initial and final scores of Y.E.G. was significant at .05(1) level (reference table no.27), as the calculated value of X$^2$ 9.84 was higher than the tabulated X$^2$ value of 3.84, however no significant improvements were found of control group and non-diabetic group in case of regularity, as the calculated values of X$^2$ 0.30 and 0.07 respectively were less than the tabulated X$^2$ values of 3.84. Then, it might be concluded that the yoga exercise group shown significant improvement in regularity over the control group and non-diabetic group.

**Interest in Teaching:**

In case of male subjects the differences between the initial and final scores of Y.E.G. was significant at .05(1) level (reference table no.09), as the calculated value of X$^2$ 6.89 was higher than the tabulated X$^2$ value of 3.84, but no significant improvements were found of control group and non-diabetic group in case of an interest in teaching, as the calculated values of X$^2$ 0.13 and 0.10 respectively were less than the tabulated X$^2$ value of 3.84. Then, it might be concluded that the yoga exercise group shown significant improvement on interest in teaching over the control group and non-diabetic group.

In case of female subjects the differences between the initial and final scores of Y.E.G. was significant at .05(1) level (reference table no.28), as the calculated value of X$^2$ 5.71 was higher than the tabulated X$^2$ value of 3.84, but no significant improvements were found of control group and non-diabetic group in case of an interest in teaching, as the calculated values of X$^2$ 0.57 and 0.08 respectively were less than the tabulated X$^2$ value of 3.84. Then, it might be concluded that yoga exercise group shown significant improvement on interest in teaching over the control group and non-diabetic group.

**Participation in Co-curricular Activities:**

In case of male subjects the differences between the initial and final scores of Y.E.G. was significant at .05(1) level (reference table no.10), as the calculated value of X$^2$ 4.48 was higher than the tabulated X$^2$ value of 3.84, but no significant improvements were found of control group and non-diabetic group in case of participation in co-curricular activities, as the calculated values of X$^2$ 0.01 and 0.13 respectively were less than the tabulated X$^2$ value of 3.84. Then, it
might be concluded that the yoga exercise group shown significant improvement about participation in co-curricular activities over the control group and non-diabetic group.

In case of female subjects the differences between the initial and final scores of Y.E.G. was significant at .05(1) level (reference table no. 29), as the calculated value of X2 5.82 was higher than the tabulated X2 value of 3.84, but no significant improvements were found of control group and non-diabetic group in case of participation in co-curricular activities, as the calculated values of X2 0.15 and 0.30 respectively were less than the tabulated X2 value of 3.84. Then, it might be concluded that the yoga exercise group shown significant improvement about participation in co-curricular activities over the control group and non-diabetic group.

Co-operative Attitude:

In case of male subjects the differences between the initial and final scores of Y.E.G. was significant at .05(1) level (references table no.11), as the calculated value of X2 4.34 was higher than the tabulated X2 value of 3.84, but no significant improvements were found of control group and non-diabetic group in case of co-operation attitude, as the calculated values of X2 0.01 and 0.02 respectively were less than the tabulated X2 value of 3.84. Then, it might be concluded that the yoga exercise group shown significant improvement about co-operative attitude over the control group and non-diabetic group.

In case of female subjects the differences between the initial and final scores of three groups (Y.E.G., C.G. and N.D.G.) were not significant at .05(1) level (reference table no.30), as the calculated X2 values were less than the tabulated X2 value .05(1) of 3.84. Then, it might be concluded that the effect of yoga exercises were insignificant all the three groups in case of co-operative attitude.

Professional Attitude:

In case of male subjects the differences between the initial and final scores of Y.E.G. was significant at.05 (2) level (reference table no.12), as the calculated value of X2 9.75 was higher than the tabulated X2 value of 5.99, but no significant improvements were found of control group and non diabetic group in case of professional attitude, as the calculated values of X2 0.06 and 0.06 respectively were less than the tabulated X2 value of 3.84. Then, it might be concluded that the yoga exercise group shown significant improvement about professional attitude over the
control group and non-diabetic group.

In case of female subjects the differences between the initial and final scores of three groups (Y.E.G., C.G. and N.D.G.) were not significant at .05(2) level (reference table no.31), as the calculated X2 values were less than the tabulated X2 value .05(2) of 5.99. Then, it might be concluded that the effect of yoga exercise were insignificant all the three groups in case of professional attitude.

Teacher pupil Relationship:

In case of male subjects the difference between the initial and final scores of three groups (Y.E.G., C.G. and N.D.G.) were not significant at .05(1) level (reference table no.13), as the calculated X2 value were less than the tabulated X2 value .05(1) of 3.84. Then, it might be concluded that the effect of yoga exercises were insignificant all the three groups in case of teacher pupil relationship.

In case of female subjects the differences between the initial and final scores of Y.E.G. was significant at .05(1) level (reference table no.32), as the calculated value of X2 4.71 was higher than the tabulated X2 value of 3.84, but no significant improvements were found of control group and non-diabetic group in case of teacher pupil relationship, as the calculated values of X2 0.13 and 0.51 respectively were less than the tabulated X2 value of 3.84. Then, it might be concluded that the yoga exercise group shown significant improvement about teacher pupil relationship over the control group and non-diabetic group.

TEACHING EFFECTIVENESS (Students Rating): Regularity:

In case of male subjects the difference between the initial and final scores of Y.E.G. was significant at .05(1) level (reference table 14), as the calculated value of X2 7.75 was higher than the tabulated X2 value of 3.84, but no significant improvements were found of control group and non-diabetic group in case of regularity, as the calculated values of X2 0.04 and 0.06 respectively were less than the tabulated X2 value of 3.84. Then, it might be concluded that the yoga exercise group shown significant improvement in regularity over the control group and non-diabetic group.

In case of female subjects the difference between the initial and final scores of Y.E.G. was significant at .05(1) level (reference table no.33), as the calculated value of X2 6.52 was
higher than the tabulated X2 value of 3.84, but no significant improvements were found of control group and non-diabetic group in case of regularity, as the calculated values of X2 0.09 and 0.07 respectively were less than the tabulated X2 value of 3.84. Then, it might be concluded that the yoga exercise group shown significant improvement in regularity over the control group and non-diabetic group.

**Interest in Teaching:**

In case of male subjects the differences between the initial and final scores of Y.E.G. was significant at .05(1) level (reference table no.15), as the calculated value of X2 4.54 was higher than the tabulated X2 value of 3.84, but no significant improvements were found of control group and non-diabetic group in case of interest in teaching, as the calculated values of X2 0.06 and 0.01 respectively were less than the tabulated X2 value of 3.84. Then, it might be concluded that the yoga exercise group shown significant improvement on interest in teaching over the control group and non diabetic group.

In case of female subjects the differences between the initial and final scores of Y.E.G. was significant at .05(1) level (reference table no.34), as the calculated value of X2 5.28 was higher than the tabulated X2 value of 3.84, but no significant improvements were found of control group and non diabetic group in case of interest in teaching, as the calculated values of X2 0.21 and 0.07 respectively were less than the tabulated X2 value of 3.84. Then, it might be concluded that the yoga exercise group shown significant improvement on interest in teaching over the control group and non diabetic group.

**Participation in Co-curricular Activities:**

In case of male subjects the differences between the initial and final scores of Y.E.G. was significant at .05(1) level (reference table no.16), as the calculated value of X2 4.82 was higher than the tabulated X2 value of 3.84, but no significant improvements were found of control group and non diabetic group in case of interest in teaching, as the calculated values of X2 0.04 and 0.02 respectively were less than the tabulated X2 value of 3.84. Then, it might be concluded that the yoga exercise group shown significant improvement about participation in co-curricular activities over the control group and non diabetic group.
In case of female subjects the differences between the initial and final scores of three groups (Y.E.G., C.G. and N.D.G.) were not significant at .05(1) level (reference table no.35), as the calculated X2 values were less than the tabulated X2 values .05(1) of 3.84. Then, it might be concluded that the effect of yoga exercises were insignificant all the three groups in case of participation in co-curricular activities.

Co-operative Attitude:

In case of male subjects the differences between the initial and final scores of three groups (Y.E.G., C.G. and N.D.G.) were not significant at .05(1) level (reference table no.17), as the calculated X2 values were less than the tabulated X2 values .05(1) of 3.84. Then, it might be concluded that the effect of yoga exercises were insignificant all the three groups in case of co-operative attitude.

In case of female subjects the differences between the initial and final scores of Y.E.G. was significant at .05(1) level (reference table no.36), as the calculated value of X2 4.36 was higher than the tabulated X2 value of 3.84, but no significant improvements were found of control group and non diabetic group in case of co-operative attitude, as the calculated values of X2 0.08 and 0.10 respectively were less that the tabulated X2 value of 3.84. Then, it might be concluded that the yoga exercise group shown significant improvement about co-operative attitude over the control group and non diabetic group.

Professional Attitude:

In case of female subjects the differences between the initial and final scores of Y.E.G. was significant at .05(2) level (reference table no.18), as the calculated value of X2 7.56 was higher than the tabulated X2 value of 5.99, but no significant improvements were found of control group and non diabetic group in case of Professional attitude, as the calculated values of X2 0.34 and 0.06 respectively were less that the tabulated X2 value of 5.99. Then, it might be concluded that the yoga exercise group shown significant improvement about professional attitude over the control group and non diabetic group.

In case of male subjects the differences between the initial and final scores of three groups (Y.E.G., C.G. and N.D.G.) were not significant at .05(2) level (reference table no.37), as the calculated X2 values were less than the tabulated X2 values .05(2) of 5.99. Then, it might be
concluded that the effect of yoga exercises were insignificant all the three groups in case of professional attitude.

**Teacher pupil Relationship:**

In case of male subjects the differences between the initial and final scores of three groups (Y.E.G., C.G. and N.D.G.) were not significant at .05(1) level (reference table no.19), as the calculated X2 values were less than the tabulated X2 values .05(1) of 3.84. Then, it might be concluded that the effect of yoga exercises were insignificant all the three groups in case of teacher pupil relationship.

In case of female subjects the differences between the initial and final scores of three groups (Y.E.G., C.G. and N.D.G.) were not significant at .05(1) level (reference table no.38), as the calculated X2 values were less than the tabulated X2 values .05(1) of 3.84. Then, it might be concluded that the effect of yoga exercises were insignificant all the three groups in case of teacher pupil relationship.

**CONCLUSIONS:**

Administration of the prescribed yoga exercises was limited to 24 (twenty four) weeks only. This period seemed to be very limited for such experiment. For good and satisfactory results experiment for longer period would have been necessary. In spite of the limitations it could be said that 24 (twenty four) weeks of yoga exercises for the diabetic patients, showed more than marginal improvement of various parameters of organic disorder and teaching effectiveness. In this connection it should be admitted that the changes in all the parameters of organic disorder and teaching effectiveness were not significant in case of both male and female subjects. It is obvious that there is a need of well controlled and longer. It is intended to study the effects of yoga exercises regarding diabetic persons in respect of diabetic patients. In short, all factors involving the experiment, as well as the subjects under experiment should be under the complete control of the experimenter order to have a result oriented experiment like this one.

It was also hoped that more fortunate physical education teachers bent on under taking such a project would be able to show results which would help in days to come in removing apathetic attitude of the general people even the doctors toward these groups of patient teachers.