Chapter V

SUMMARY, CONCLUSION AND RECOMMENDATIONS

Summary

Physical fitness is not something with which we are born, but something we develop and maintain by continuous effort. When one exercises correctly and eats a balanced diet, the body responds, grows stronger and becomes more fit. But when the body does not get the correct exercises and food it needs, it gradually deteriorates and loses strength, speed, flexibility and endurance.

Growth and development is influenced by many factors, such as genetic structure, physical body-built socio-economic condition etc. Of all the external factors influencing growth, physical exercise is an extremely important one. In comparison to other factors, the role of vigorous physical activity, as an adjunct of growth, can be easily estimated. Yoga, another way of education and culture, has equally gained its importance recently though this discipline is very old and traditional. Research has indicated that
regular practice of yoga brings about positive effect for
the maintenance and development of total health and fitness.

The purpose of the study was to compare the effect
of yoga and gymnastic programmes on growth pattern of the
primary school children.

The study was undertaken by selecting one hundred and
five students studying in classes IV and V of Hooghly Branch
(Govt.) School, Hooghly, West Bengal. The subjects were
divided randomly into two experimental groups and one control
group containing thirty five subjects each. The experimental
group A was trained on yogic exercises, the experimental
group B was trained on gymnastic exercises and group C served
as the control.

The anthropometric variables selected for this study
were: weight, standing height, sitting height, acromial
height, decylion height, arm length, tibial height, leg
length, upper leg length, biacromial diameter, bitrochanto-
rium diameter, circumferences and skinfolds for percentage of
body fat. The motor fitness variables selected were: speed,
strength, endurance, flexibility and agility and the physio-
logical variables were heart rate, blood pressure negative
and positive breath holding times and VO$_2$ max. While
selecting these variables the feasibility criteria as well as the acceptability of the variables by the subjects was kept in mind.

The training schedule consisted of gymnastic and yogic exercises. The training programme in gymnastic was prepared with the help of experts and the yoga programme was developed with the help of Central Research Institute for Yoga, New Delhi.

The subjects belonging to the two experimental groups (A and B) participated in the regular and a progressive exercise programme, three day/week, for a period of ten months. The total number of classes were divided into five training sessions, each of two months' duration.

The analysis of data reveals that, in respect of weight, tibial height, upper leg length, calf circumference and percentage of body fat, both the experimental groups have produced equal training effects. In the case of remaining circumferences the gymnastic training group was found to be superior to that of the yoga group and yoga group was found to be superior as compared to the control group. In the case of body weight, upper leg length, and all the circumferences both the experimental groups were found to be superior
to that of the control group. However, in respect of tibial height, no difference was observed between the yoga group and the control group and in the case of the percentage of body fat, the difference between the gymnastic group and the control group was not found to be significant. The yoga group was found to be more effective with regard to standing height and sitting height. In respect of standing height the yoga group and the gymnastic group were found to be superior to that of the control group whereas in the case of sitting height the yoga group was found to be better than the control group but no significant difference was observed between the gymnastic group and the control group.

The application of analysis of variance and covariance to motor fitness components reveals that in the case of 50-yard dash, sit and reach test, standing broad jump and bridge-up test both the experimental groups have proved to be equally effective. In the case of shoulder rotation, the gymnastic group has been found to be more effective as compared to the yoga group and the control group and the yoga group has been found to be superior to that of the control group. In respect of "sit and reach" and "bridge-up" tests both the experimental groups were found to be significantly better than that of the control group. In the case of 50-yard dash and standing broad
jump the gymnastic training group was significantly better than the control group and no significant difference was observed in the case of these two variables between the yoga group and the control group.

From the analysis of data, it is seen that in respect of systolic blood pressure, diastolic blood pressure, and positive breath holding time both the experimental groups have produced equal training effect and are superior to that of the control group. In the case of negative breath holding time and $V_O^2_{max}$, the yoga group has been found to be significantly better as compared to gymnastic group as well as the control group and in these variables no significant difference was observed between the gymnastic group and the control group. Regarding heart rate, the gymnastic group was superior to that of the yoga group and both the experimental groups were found to be significantly better than that of the control group.

Conclusions

Within the limitation of the present study the following conclusions may be drawn:

1. Yoga and gymnastic training programmes employed in the study were found to be effective in bringing about a
significant change in the selected anthropometric variables (weight, standing height, sitting height, tibial height, upper leg length, upper arm circumference, forearm circumference, thigh circumference, calf circumference and percentage of body fat), motor fitness components (50-yard dash, sit and reach test, bridge-up test, shoulder rotation and standing broad jump) and physiological variables (heart rate, systolic and diastolic blood pressures, positive and negative breath holding times and VO₂ max.) during a training programme of 10 months duration.

2. In respect of body weight, upper leg length and calf circumference, the two modes of training that is yogenic and gymnastic exercises proved to be equally effective.

3. The gymnastic training programme was found to be superior to that of yoga programme in significantly affecting tibial height, upper arm, forearm and thigh circumferences and percentage of body fat.

4. Yoga training programme was found to be superior to that of gymnastic programme in bringing about a significant change in standing height and sitting height.

5. Both the experimental groups proved to be better than the control group in respect of body weight, upper leg
length, upper arm, forearm, thigh and calf circumferences and standing height.

6. Yoga training programme failed to bring about a significant change in tibial height as compared to the control group.

7. Gymnastic training group and the control group did not differ in their performance in respect of percentage of body fat and sitting height.

8. In the case of selected motor fitness components, the two modes of training brought about equal training effect in respect of 50-yard dash, 'sit and reach' test, 'bridge-up' test and standing broad jump.

9. In shoulder rotation, the gymnastic training programme was found to be superior to that of yogic exercises.

10. Yogic and gymnastic exercise schedules were found to be superior to that of the control group in the case of sit and reach test, shoulder rotation and bridge-up test.

11. In 50-yard dash the gymnastic training group was found to be superior to that of the control group whereas no difference was found between the yoga group and control group.
12. The yoga group and the control group did not differ significantly in their standing broad jump performance as a result of 10-month training.

13. In respect of systolic and diastolic blood pressure and positive breath holding time, the two modes of training that is yogic exercises and gymnastic exercises brought about an equal training effect as a result of 10-month training.

14. Gymnastic training programme was superior to that of yoga training programme in significantly affecting the heart rate.

15. With regard to heart rate, systolic and diastolic blood pressures and positive breath holding time the two modes training proved to be effective as compared to the control group.

16. Yogic exercises brought about a significant change in negative breath holding time and VO$_2$ max as compared to the control group. However the gymnastic exercise group and the control group did not differ significantly in these two variables.

17. The two modes of training employed in the study did not significantly affect height acromial, height decyilion,
arm length, leg length, biacromial diameter, bitrochantorion
diameter, 4 x 10 mts shuttle run and 600-yard run/walk.

Recommendations

In the light of the conclusions drawn, the following recommendations are made:

1. Physical education teachers and coaches should administer yoga and gymnastic exercises to their school children at the upper primary school stage to bring about faster growth and also quicker development in motor components and physiological variables.

2. In the light of the results of the study preference be given to yoga exercises or gymnastic exercises for bringing about faster development in selected anthropometric variables, motor fitness components and physiological variables.

3. Since the growth pattern of the child is influenced by many factors, there is a need to study the effect of physical activities, socio-economic conditions and nutrition on the growth pattern of children.

4. The study may be repeated having subjects of age and sex other than those employed in the study.
5. The similar study may be carried out for a longer duration so as to have a clear cut idea regarding superiority of one programme over the other on growth pattern of primary school children.

6. The present study may be replicated using variables other than those employed in this study.