Chapter V

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

Summary

Obesity today is considered as global problem. If effects all the population group specially women of reproductive age and children. It has reported that obesity exists to a great extent among the children and adolescent. Further more in India childhood obesity is a major problem in urban area specially in major cities among school children more over it was found that the trend of obesity is the root cause of chronic diseases which involve diabetes mellitus, coronary heart diseases orthopedic disorder and respiratory diseases.

Thus, it is vital to find out a suitable intervention for Indian preadolescent school children to resolve the problem of obesity. In this context Indian traditional system of yoga therapy (lifestyle modification) and/or naturopathy seems to be effective.

Hence, the researcher of this study conducted this study with the following objectives:

- To assess the level of obesity of preadolescent school girls.
- To develop program of yoga and naturopathy especially for the obese school girls.
- To study the effect of yoga training, naturopathy treatment and their combined therapy for controlling morphological, physiological and biochemical markers of obesity in school girls.

In compliance of the above objectives, one hundred and twenty (n=120) obese girls, age ranged from 11-12 years from the schools of Lonavla city participated in this experiment. These students were divided into four major groups. In each group 30 students were selected randomly viz., Group –I Yoga Group, Group-II Naturopathy Group, Group- III Yoga + Naturopathy and Group - IV Control Group.
Standard tools were used to measure the selected morphological, physiological and biochemical indicators of obesity and to record pre test data. Further, the subjects of all the experimental groups underwent separate systematically designed yoga training, naturopathy treatment and yoga plus naturopathy intervention daily one hour considering six days in a week, except leaving days, for twelve weeks. After completion of twelve weeks period of imparting training interventions with different stimuli (i.e., Yoga, naturopathy and yoga plus naturopathy), all the subjects representing four groups were post tested with all the variables. There were total seven subjects drop out from three experimental groups.

Summarizing Results

The results of ANCOVA followed by Scheffe’s post hoc test for each of the morphological, physiological and biochemical markers of obesity have been summarized below –

A) Result on Morphological variables

**Body Mass Index:**

- “Yoga training” was found significantly superior to “Naturopathy training” in improving Body Mass Index.

- “Yoga plus naturopathy training” showed significant superiority over the “Yoga training” and “Naturopathy training” respectively in improving Body Mass Index.

**Body Fat:**

- “Naturopathy training” was found significantly superior to “Yoga training” in controlling Body fat.

- “Yoga plus naturopathy training” showed significant superiority over the “Naturopathy training” and “Yoga training” respectively in controlling Body fat.
Abdominal girth:

- “Yoga training” was found significantly superior to “Naturopathy training” in controlling Abdominal girth.

- “Yoga plus naturopathy training” showed significant superiority over the “Naturopathy training” and “Yoga training” respectively in controlling Abdominal girth.

Hip girth:

- “Naturopathy training” was found significantly superior to “Yoga training” in reducing Hip girth.

- “Yoga plus naturopathy training” showed significant superiority over the “Naturopathy training” and “Yoga training” respectively in controlling Hip girth.

B) Result on Physiological variables

Systolic Blood Pressure:

- “Yoga training” had similar effects like “Naturopathy training” in Systolic Blood Pressure.

- “Yoga plus naturopathy training” also had similar effect like “Yoga training” and “Naturopathy training” in controlling Systolic Blood Pressure.

Diastolic Blood Pressure:

- “Yoga training” had similar effects like “Naturopathy training” in Diastolic Blood Pressure.

- “Yoga plus naturopathy training” also had similar effect like “Yoga training” and “Naturopathy training” in controlling Diastolic Blood Pressure.
**Pulse rate:**

- “Yoga training” was found significantly superior to “Naturopathy training” in reducing Pulse rate.

- “Yoga plus naturopathy training” had similar effect like “Yoga training” and showed significant superiority over the “Naturopathy training” in reducing Pulse rate.

**C) Result on Biochemical variables**

**Cholesterol:**

- “Yoga training” had similar effects like “Naturopathy training” in controlling Cholesterol.

- “Yoga plus naturopathy training” had significantly better effect than “Yoga training” and “Naturopathy training” respectively in controlling Cholesterol.

**Triglyceride:**

- “Yoga training” was found superior to the “Naturopathy training” in controlling Triglyceride.

- “Yoga plus naturopathy training” had significantly better effect than “Yoga training” and “Naturopathy training” respectively in controlling Triglyceride.

**HDL Cholesterol:**

- “Yoga training” was found similar to the “Naturopathy training” in controlling HDL Cholesterol.

- “Yoga plus naturopathy training” had significantly better effect than “Yoga training” and “Naturopathy training” respectively in improving HDL Cholesterol.
**LDL:**

- “Yoga training” was found superior to the “Naturopathy training” in controlling LDL.
- “Yoga plus naturopathy training” had significantly better effect than “Yoga training” and “Naturopathy training” respectively in controlling LDL.

**VLDL:**

- “Yoga training” was found superior to the “Naturopathy training” in controlling VLDL.
- “Yoga plus naturopathy training” had significantly better effect than “Yoga training” and “Naturopathy training” respectively in controlling VLDL.

**Cardio-vascular risk ratio:**

- “Yoga training” was found superior to the “Naturopathy training” in controlling Cardio-vascular risk ratio.
- “Yoga plus naturopathy training” had significantly better effect than “Yoga training” and “Naturopathy training” respectively in controlling Cardio-vascular risk ratio.

**Leptin:**

- “Yoga training” was found superior to the “Naturopathy training” in controlling Leptin.
- “Yoga plus naturopathy training” had significantly better effect than “Yoga training” and “Naturopathy training” respectively in controlling Leptin.

**Major Findings**

Comparison of results between “yoga training”, “naturopathy training” and “yoga plus naturopathy training” on the selected attributes of morphological markers of obesity revealed that –
Yoga training was found superior to naturopathy in improving BMI (body mass index) and abdominal muscles girth.

Naturopathy was found superior to yoga training in reducing body fat and hip girth.

The combined training (i.e., yoga plus naturopathy) was found superior to yoga training and naturopathy training to reduce body fat that might have improved Body Mass Index, abdominal muscles girth and hip girth.

Comparison of results between “yoga training”, “naturopathy training” and “yoga plus naturopathy training” on the selected attributes of physiological markers of obesity revealed that –

Yoga training had similar effects like “Naturopathy training” in maintaining normal level of systolic blood pressure and diastolic blood pressure.

Naturopathy was found superior to yoga training in reducing pulse rate.

The combined training (i.e., yoga plus naturopathy) was found superior to yoga training and naturopathy training to reduce pulse rate that might have improved the circulatory efficiency of the obese school girls.

Thus, none of the training could influence the level of systolic and diastolic blood pressure in obese school girls.

Comparison of results between “yoga training”, “naturopathy training” and “yoga plus naturopathy training” on the selected attributes of biochemical markers of obesity revealed that –

Yoga training had similar effects like “Naturopathy training” in reducing total cholesterol and in maintaining HDL cholesterol.

Yoga training was found superior to naturopathy training in reducing triglyceride, LDL, VLDL, cardio-vascular risk ratio and leptin.
• Naturopathy was found inferior to yoga training in reducing most of the affective biomarkers of obesity in the school girls.

• The combined training (i.e., yoga plus naturopathy) was found superior to yoga training and naturopathy training for controlling biochemical biomarkers of obesity.

Conclusions

This study, within limitations, draws following conclusions:

• Each of the training interventions viz., yoga, naturopathy and yoga plus naturopathy contributes to improve BMI (Body Mass Index) and reduce abdominal girth, hip girth and body fat of the school girls. However, combined intervention i.e., yoga plus naturopathy works effectively for controlling the morphological biomarkers of obesity.

• The training interventions viz., yoga, naturopathy and yoga plus naturopathy contribute to reduce pulse rate of the obese school girls, whereas none of these interventions could change in systolic and diastolic blood pressures. However, combined intervention i.e., yoga plus naturopathy works effectively controls the physiological biomarkers of obesity.

• Each of the training interventions viz., yoga, naturopathy and yoga plus naturopathy contributes to improve HDL cholesterol among the obese school girls, whereas all of these interventions could significantly reduce the level of total cholesterol, Low density lipoprotein, VLDL Very low density lipoprotein, triglyceride TG, cardiovascular risk ratio (CV risk), and Leptin in blood. However, combined intervention i.e., yoga plus naturopathy works effectively for controlling the biochemical biomarkers of obesity.

• Obesity of school girls can be controlled significantly if they practice yoga along with naturopathy daily one hour considering six days in a week for a total period of twelve weeks.
Recommendations and further suggestions

On the basis of results and conclusion, this study recommends and suggests the followings:

• Obese school girls are advised to practice yoga along with naturopathy daily one hour for a total period of minimum twelve weeks.

• Obese school girls must practices yoga in combination with naturopathy under overall supervision of a professionally qualified naturopathy teacher.

• If the facilities of naturopathy are not available, the obese girls may practice yoga alone as an alternative therapy. However, to record quick reduction in obesity, one must practice the combined intervention of yoga and naturopathy.

• Follow up study with similar research design on the subjects of different age and sex groups is suggested for further research.

Contribution to the Knowledge

Although the knowledge of yoga and naturopathy is evolved from the Indian soil, today they have become popular worldwide. In fact, the role of yoga in controlling obesity is known, whereas impact of naturopathy on obesity is unknown. Moreover, literature regarding efficacy of yoga plus naturopathy especially on obese school girls is meager and research based data on this line is not available so far. The present study, therefore, has presented an experiment based the schedules of yoga and naturopathy for controlling obesity of obese school girls and added research based data to quantum of knowledge in the area of medical science and physical education.