Chapter V

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

Summary

The purpose of this study was to determine and compare the alterations in cardio-pulmonary index, body composition and anaerobic capacity as a result of similar training programme in males and females.

The subjects were eighty students (40 males and 40 females) of Shaheed Kanshi Ram College of Physical Education, Bhago-Majra, Distt. Ropar, Panjab, studying for certificate course in Physical Education. The age of these subjects ranged from 16 to 19 years. These subjects were randomly divided into four groups - two each for boys and girls - with 20 subjects in each group. Further, two experimental groups (one each for boys and girls) and two control groups (one each for boys and girls) were randomly selected. The experimental groups were named EB (Boys' Group) and EG (Girls' Group) and remaining two groups, one each of males (Group CB) and females (Group CG), served as control groups. The two experimental groups (Group EB and Group EG) participated in planned similar training programme for males and females consisting of strength, speed, endurance, agility, flexibility qualities.
The cardio-pulmonary efficiency of all the subjects was determined by C-P index which included the measures of pulse rate, maximum expiratory pressure, maximum breath holding time, diastolic blood pressure, systolic blood pressure, vital capacity and age. Adynamic (resting), dynamic (directly after the performance of measured physical activity) and restoration (after a specified resting period) phases of C-P index were covered. In order to determine the percentage of body fat, the four skinfold measurements at Biceps, Triceps, Subscapular and Suprailiac were recorded with the help of skinfold caliper and total value of skinfold was referred to the conversion chart prepared by Durnin and Rehman. Anaerobic capacity was measured by 50 metre run and Margaria's stair climbing test. The data on these variables were recorded before the start of training, after four weeks, after eight weeks and at the end of experimental period of twelve weeks.

The data were submitted to analysis of variance (ANOVA) and analysis of covariance (ANCOVA). For post hoc analysis, Scheffe's Post Hoc Test was applied where F-ratios were found significant. The hypothesis was tested at .05 level of significance.

The analysis of variance for the pretest, after four weeks test, after eight weeks test and post test means of cardio-pulmonary index (adynamic) resulted in significant
F-ratios for both the experimental groups (Group EB, F=13.97; Group EG, F = 14.57), significant F-ratios (Group EB, F = 28.13; Group EG, F = 26.31) for cardio-pulmonary index (dynamic) and (Group EB, F = 12.86; Group EG, F = 17.88) for cardio-pulmonary index (restoration) for both the experimental groups respectively. Similarly the significant F-ratios (Group EB, F = 11.80; Group EG, F = 3.39) for percentage of body fat and (Group EB, F = 3.87; Group EG, F = 3.95) for anaerobic capacity as measured by 50 metre run were obtained. The control groups CB and CG did not show any significant differences in the chosen variables as a result of training. The differences between pre-test, after four weeks test, after eight weeks test and post-test scores were not found statistically significant in lean body weight (Group EB, F = 0.32; Group EG, F = 0.39) and anaerobic capacity as measured by Margaria power test (Group EB, F = 0.76; Group EG, F = 1.84). Analysis of data further revealed through the Scheffe's post hoc test that both the experimental groups EB and EG showed statistically significant improvement in C-P index adynamic, dynamic, and in restoration phase and body fat percentage after eight weeks and twelve weeks period of training whereas significant improvement in 50 metre run timings was observed only after twelve weeks training period.

The analysis of covariance when applied to find out the significance of differences among the adjusted final
means of the two experimental groups (EB and EG) and two control groups (CB and CG) resulted in a significant F-value at .05 level of significance in cardio-pulmonary index adynamic \( (F = 22.99) \), cardio-pulmonary index dynamic \( (F = 49.05) \), cardio-pulmonary index restoration \( (F = 26.44) \), body fat percentage \( (F = 24.96) \) and anaerobic capacity as measured by 50 metre run \( (F = 21.47) \).

The F-value for the anaerobic capacity measured by Margaria power test and lean body weight were not significant at .05 level.

As the analysis of covariance (ANCOVA) showed significant differences among the groups in the variables of C-P index (adynamic, dynamic and restoration), body fat percentage and anaerobic capacity as measured by 50 metre run, the Scheffe's post hoc test was applied to find which of the differences between means amongst the groups were statistically significant. Scheffe's post hoc analysis indicated that the mean gains by group EB and EG were significantly higher in C-P index (adynamic, dynamic and restoration), body fat percentage and anaerobic capacity as measured by 50 metre run as compared to their respective control groups. Further the mean gain by group EB in comparison to group EG was much higher in almost all the variables.
Conclusions

Within the limitations identified and on the basis of the findings of the study, the following conclusions were drawn:

1. Similar Training Programme was significantly effective in improving the cardio-pulmonary functional efficiency of the male and female students at college level, age ranging between 16 to 19 years as determined by cardio-pulmonary index (adynamic, dynamic and restoration phases).

2. Percentage of body fat of the male and female students at college level reduced significantly as a result of twelve weeks training programme and the male students showed significantly more reduction in fat percentage than their female counterparts after twelve weeks of training programme.

3. Both the males and females did not show any significant change in lean body weight as a result of twelve weeks training.
4. Twelve weeks training programme was significantly effective in improving the anaerobic capacity of the males and females as measured by 50 metre run. However, there was no significant improvement in anaerobic capacity when measured by Margaria power test.

5. Males and females showed almost same patterns of training effects when initial, intermittent and final effects of training were examined and twelve weeks training period was significantly effective in altering the C-P index, body fat percent and anaerobic capacity as measured by 50 metre run.

6. The control group did not show any significant change in cardio-pulmonary index (adynamic, dynamic and restoration), body composition and anaerobic capacity.

**Recommendations**

In the light of the conclusions arrived at in this study, the following recommendations are made:

1. While planning physical activity programs in colleges/schools similar training programs may be
recommended for desired improvements in males and females with regard to general fitness qualities such as C-P index, body composition and anaerobic capacity.

2. To save time, effort, space, and cost males and females students may be brought together for general fitness training.

3. If possible the training programme may be planned for a duration of twelve weeks or more to achieve significant improvement.

4. Similar studies may be conducted on elite athletes.

5. Similar studies may also be carried out on subjects of different age groups and sex.