Chapter V

SUMMARY, CONCLUSION AND RECOMMENDATIONS

Summary

As sports have developed into a distinct scientific discipline each Nation is vying with the other to produce top class players to bag laurels in the International Competitions. Considerable research is being implemented to identify factors that are predictive of achieving high levels of skill in a given sport with proper coaching.

Of the various components of physical and motor fitness involved in competitive sports and work performance, Endurance is of utmost importance. The standard of performance in the sporting arena has gone beyond our imagination. There is no limit to human performance. It is getting closer and closer towards impossibility. Barriers have been broken and new records have been created.

Some of the main factors which are responsible for the super performances are improvement in the quality and quantity of facilities and equipment. Progressive
advance in the methods of scientific coaching, extensive and intensive research in the fields of exercise physiology and mechanics, year round competition, providing programme of Physical Education in School, College and Universities, availability of new literature and recognition of sports by the government and spectators.

Competitions in endurance events have also started to attract a large number of competitors. Competitions have acquired greater keenness with at least two or three athletes competing for the first position in the last segment of the race. Thus a number of training techniques have sprung up, each claiming the merit of producing a number of champions at the international arena.

The three most popular training methods for the development of endurance are: Continuous running, Partlek and Interval running. Each of these appears equally useful in producing renowned record holders from mile to marathon. Both the coaches and promising athletes are at times confused regarding the choice of a suitable method of training to choose from, in order
to get the best results. It is true that each method is sufficient enough to improve different physiological processes responsible for endurance performance or are suited to different individual athletes according to their temperament. Controversial views still exist regarding the question as to whether continuous or Interval training produces the greatest improvement in cardiovascular endurance or performance in the mile run. The purpose of the study is to compare the effects of Continuous load method and Intermittent load method on aerobic performance of subjects belonging to high and low fat groups.

The author was highly aroused by the inconsistency of the results of most of the studies done earlier. After consulting experts and also after going through the related literature, she proceeded with the study on "Comparative Effects of Continuous Loading and Intermittent Loading Methods of Training on Aerobic Performance Among Subjects Belonging to High and Low Fat Groups".

From among the healthy and fit girls of classes 9 to 12, who were not involved in any specific sports
programme, of the Government Girls Senior Secondary School No. 3, Sarojini Nagar, New Delhi, 190 female subjects were tested for body composition. Out of which 120 students were selected at random to serve as subjects. The subjects were in turn divided into four equal groups using random selection and each group was assigned at random to either of the three experimental treatments, namely, Combination of slow continuous running and intermittent running, Slow continuous running and Intermittent running to promote aerobic performance of low and high fat subjects, besides a control group.

For the Slow continuous running group the initial duration of training was 30 minutes. The progression in the training load was ensured by increasing the duration of running by five minutes every two weeks. The subjects ran at a uniform pace throughout the entire duration of the run. The Intermittent running increased from 30 in the first two weeks to 45 minutes in the last two weeks. The stimulus intensity and stimulus volume were fixed according to the ability of the subjects. The principle of 'worthwhile break' was fully utilised.
Quantitative measurements by standard techniques of the selected variables for each of the subjects were taken at the beginning and at the conclusion of an experimental period of ten weeks. Training was carried out five days a week i.e. from Monday to Friday.

The mean differences in each of the variables were analysed for significance by applying 't' test. The differential gains of the groups were also tested by F test followed by Post hoc Test wherever intergroup variance was found to be statistically significant.

When the mean differences in each of the experimental variable were analysed by 't' test, all the three experimental groups showed statistically significant changes in aerobic performance. (Group A 't' 12.27, Group B 't' 9.58, Group C 't' 12.07) in case of high fat group and (Group A 't' 11.37, Group B 't' 11.84, Group C 't' 9.35) in respect of low fat group. In case of the control group the increase in aerobic performance was not found statistically significant.

The variables which had shown statistically significant changes in one or more groups were further
subjected to $F$ test to determine intergroup variability. As the mean differences in the experimental variable showed significant $F$ ratio, Post hoc Test was applied to find which of the differences of mean gains or losses amongst the groups were statistically significant.

The analysis of variance and application of Post hoc Test showed that the mean gain made by the Slow continuous running group had proved to be more effective in improving aerobic performance as compared to Combination of slow continuous running and intermittent running group, Intermittent running group and the Control group in case of high fat subjects.

The mean gain made by the Intermittent running group was higher than the Combination of slow continuous running and intermittent running group and the Control group, whereas the Combination of slow continuous running and intermittent running group had brought better results as compared to Control group in case of high fat group subjects.

In case of low fat subjects the Slow continuous running group showed higher improvement as compared to
that of the Combination of slow continuous running and intermittent running group, Intermittent running group and the Control group. The improvement shown by the Combination of slow continuous running and intermittent running group was statistically better than the Intermittent running group and the Control group whereas the performance shown by the Intermittent running group was superior to that of the Control group.

Conclusions

On the basis of results obtained and within the limitations of this study, the following conclusions may be drawn:

1) All the three methods of endurance training i.e. loads dominated by Combination of slow continuous running and intermittent running, Slow continuous running and Intermittent running are effective in improving aerobic performance of Secondary School Girls, belonging to High and Low fat groups.

2) Training load dominated by Slow continuous running proved to be most effective in developing aerobic
performance in 8 min Run/Walk Test in both the High and the Low fat groups.

3) Training load dominated by Combination of slow continuous running and intermittent running has been found to be effective in developing aerobic performance as compared to the Intermittent running group of the subjects belonging to the low fat group.

4) Training load dominated by Intermittent running has been found to be more effective in developing aerobic performance than that of the Combination of slow continuous running and intermittent running group of subjects belonging to the high fat groups.

5) All the three methods of endurance training namely Combination of slow continuous and intermittent running, Slow continuous and Intermittent method proved to be superior as compared to the Control group in improving aerobic performance measured by 8 min Run/Walk Test.

6) Absence of improvement in the case of Control group could be a reflection of inactivity.
Recommendations

In the light of the findings of the present study, the following recommendations can be made to the coaches and physical education teachers regarding the training and coaching of athletes in secondary schools.

In training girl students at secondary school level, Slow continuous running Method may be adopted as this has proved superior to Combination of slow continuous and intermittent running Method and Intermittent running Method for developing Aerobic Performance.

Teachers of Physical Education and Coaches should use combined loads of training dominated by Slow continuous running and Intermittent running for the development of Aerobic Performance.

In the light of the present study, the following recommendations are made for further investigations in understanding the nature of endurance training:

1) As the level of endurance is dependent on a number of physiological variables and as different
methods of endurance training affect these variables differently, whether anyone method will be more advantageous to athletes at a particular level of performance requires further investigations.

2) The study may be repeated with adult females and adolescent and adult males to find out the extent to which the conclusions of the present study are applicable to these groups.

3) A similar study may be pursued by involving athletes of different proficiency levels and using specific loads of training which could be favourable for their optimum adaptation to aerobic performance, and other physical and physiological variables.

4) A similar study may be undertaken by involving different training schedules which have not been employed in the present study.

5) A similar study may be replicated to investigate the effects of combined loads of training on endurance events with regard to different body types.
6) A present study may be repeated with subjects of age, sex and body composition other than those employed in this study.

7) A similar study may be conducted by employing the same training but of different durations with more specific categorization of body composition.

8) A similar study may also be carried out by using more measurements on Anthropometry.