Chapter V

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

Summary

The purpose of the study was to compare the effects of training on Grassy surface, Non-Grassy surface, wooden surface and sand surface on physical, physiological and anthropometric variables of female players.

To facilitate this study on one hundred female players were selected as the subjects from the schools of BHEL campus, Haridwar. The age level of subjects ranged from fourteen to sixteen years. All the subjects were residing at different places. The subjects were divided into five groups of 20 each. Group 'A' practiced on grassy surface group 'B' on Non-grassy, Group 'C' on wooden, group 'D' on sand, and group 'E' acted as control group.

The physical variables selected for this study were speed, explosive strength, Cardio-vascular endurance and agility. The physiological variables were Resting Heart rate, blood pressure (systolic and diastolic), vital capacity and respiratory rate. The
anthropometric variables were weight, standing and sitting height, calf girth and thigh girth. A ten weeks training programme was employed on four surfaces. After the completion of ten weeks training programmer, data was collected of all five groups on physical, physiological and anthropometric variables. No treatment was given to the control group.

The criterion measures adopted for this study were for explosive strength was measured by using standing broad jump, for speed to 50 mts. dash, for endurance 12 mts. run of walk, for agility 4x10 meter shuttle run. For physiological variables the resting heart rate was measured by use of a stopwatch and stethoscope, for counting heart rate, blood pressure (Systolic and diastolic) was measured by using sphygmomanometer and stethoscope, vital capacity was measured with the help of wet Spiro meter, Respiratory rate was felt by placing hand just below the thoracic cavity and for anthropometrics variables the weight was measured by use a weighing machine, height (Standing and sitting) was measured by use of a anthropometric or stadiometer, calf girth and thigh girth was measured by use of steel tape. The test-retest method was used to establish the reliability.
Analysis of covariance was employed to compare the effect of training on grassy, non-grassy, wooden and sand training on of physical, physiological and anthropometric variables of female players. Further, to compare paired mean differences where 'F' ratio is significant, the post hoc test (LSD Test) was used. The level of significance was kept at 0.50 level.

The analysis exhibits that speed, explosive strength, endurance, agility were significant differences among the groups. The calculated 'F' ratio for speed is 4.08, for explosive strength 18.53, for endurance 34.106 and for agility 8.27 which were greater than the tabulated 'F' value of 2.46 at 0.05 level.

In the physiological variables resting heart rate is significant among the group. The calculated 'F' ratio for resting heart rate was 28.75, which was more than the tabulated 'F' value of 2.46 at 0.05 level of confidence. Other physiological variables were not significant. The calculated 'F' ratio for 'Vital Capacity' was 2.22, for 'Respiratory Rate' was 1.709, for 'Systolic Blood Pressure' was 2.23, and for 'Diastolic Blood Pressure' was 2.27, which was less than tabulated 'F' value 2.46 at 0.05 level of significance.
Among Anthropometrics Variables weight was significant ('F' ratio 2.93). Which was more than the tabulated Value (2.46) at 0.05 level of confidence. Other Anthropometrics Variables were not significant. The calculated 'F' ratio of Standing Height was 0, for sitting height 'F' ratio was 0, Calf Girth 'F' ratio was 1.38, and Thigh Girth f- ratio was 1.05, which was less than tabulated 'F' value 2.46 at 0.05 level of significance.

**Conclusions**

On the basis of the analysis of data and the limitations of the present study, the following conclusions may be drawn:

1. Training on different playing surfaces showed better strength performance in sand and Grassy surface in comparisons to Non-grassy, wooden and control group. Among these three surfaces the performance of strength in descending order is wooden, Non-grassy, and control group. The sand Surface group performance was the best among the five groups.

2. In case of endurance, subjects showed better performance in sand and Grassy Surface in comparison to Non-grassy, wooden and control group, among these three surfaces the performance
of endurance is better in Non-grassy comparison to wooden and wooden than control group. The sand surface group performance was the best among the five groups.

3. Training showed better speed, in the two experimental groups sand and Grassy than Non-grassy, wooden and control. Among these three, wooden is more effective than Non-Grassy and non-grassy than control. There was no significant difference between sand and grassy. But the sand surface group performance was the best among the five groups.

4. In case of Agility, Subjects showed better performance in sand and Grassy in comparison to Non-Grassy, wooden and control, within these three groups Non-Grassy better than wooden and wooden better than control group. The sand surface group performance was the best among the five groups.

5. In case of vital capacity, respiratory rate, systolic blood pressure and diastolic blood pressure there was no significant change in the five groups.

6. The grassy and sand group showed better result in Resting Heart Rate in comparison to other three groups, among other three
groups Wooden is better than Non-Grassy and Non-grassy is better than control group. There was no significant difference between grassy and sand. But the sand surface group result was best among the five groups.

7. With reference to standing height, sitting height, calf girth and thigh girth variables, there was no significant change in the four experimental group and control group.

8. Training showed better weight in the sand and Grassy, than the Non-grassy wooden and control group, within these three wooden was better than Non-Grassy and control than the Non-Grassy. There was no significant difference between sand and Grassy even then sand performance was better than four groups.

9. The training programme on sand must be encouraged because it gives better performance in strength, endurance, speed, agility, resting heart rate and weight.

**Recommendations**

In the light of the conclusions drawn from the study it is recommended that:
1. A study may be undertaken with fully residential subjects (male and female) of different age groups.

2. Training programmers may be carried out for a longer duration.

3. Training programmes may be carried out on some other and more variables.

4. Similar studies may be conducted on other surfaces.

5. Similar studies may be conducted on some other games

6. Training programmes may be making more effective with the help of some other additional equipment.

7. Similar study may be undertaken on the others physical, physiological, and anthropometric variables (other than those employed in this study).

9. Physical education teachers and coaches should widely employ training programme on different surfaces at different levels of schools, colleges, universities, states, and national levels.