Chapter V

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

Summary

The purpose of the study was to investigate the effect of biorhythm of selected hockey skill performance on varying sleeping timings.

The subjects were 48 male students of Lakshmibai National College of Physical Education, Gwalior, studying in the Bachelor and Master Degree classes of Physical Education. The age of the subjects for the purpose of this study were ranged between 17-24 years. The subjects were divided into four groups, 12 in each group on the basis of the pre-test. These groups were randomly assigned to different experimental groups. Such as Normal Group, Early Group, Late Group and Irregular Group. Before administration of the test all the groups were given ten days of exposure to their respective sleep conditions i.e. Normal Group, subjects were asked to go to bed approximately around 10.00 pm. daily, and it was fully ensured that all subjects were on bed by around 10.00 pm.

Early Group, subjects were asked to go to bed daily two or more hours earlier than the normal schedule timings and care had been taken in terms of their sleeping time and it was ensured that all subjects maintained the timings throughout ten days of exposure.
Late Group, subjects were allowed to go to bed in late night 3 or more hours after the normal sleep time. To keep them awake they were sometimes shown movies or other sort of enjoyment during the ten days of exposure. It was ensured that all subjects went to bed late in night.

Irregular Group, during ten days of exposure were allowed to go to bed late on 1st, 4th, 7th and 9th day; at normal sleep time 2nd, 5th and 8th day; and early on 3rd, 6th and 10th day. Care had been taken in respect of their sleep timings and it was ensured that all subjects maintained the timings.

All the subjects were residents of the College and they had similar routine of the college activity and they also had similar routine of diet, work, rest, sleep etc. All the subjects enjoyed good health, which was verified from the college health centre records and all of them participated in the regular activities in accordance with the requirement of college curriculum.

The necessary data on selected hockey skill performance were selected at different time of the day by administering the specific skill test on separate days at the following timings:

Between 7.00 am. - 8.00 am.
Between 10.00 am. - 11.00 am.
Between 1.00 pm. - 2.00 pm.
Between 4.00 pm. - 5.00 pm.
The data were collected at the hockey field of Lakshmibai National College of Physical Education, Gwalior.

The criterion measures of selected hockey skill performance in this study are Angular Hitting and Stopping, Pass Receiving, Dribbling and Hitting, and Dribbling and Goal Shooting.

The data pertaining to each of the selected hockey skill performance of different groups during different time of day was examined by Two Way Analysis of Variance in order to determine the differences if any. In case of significant difference among different groups, among different time of day and among the interactions of different groups and different time of day means by Two Way Analysis of Variance. The Scheffé's Post-hoc Test was applied to assess the significant differences. The level of significance to test the F-ratio obtained by Two Way Analysis of Variance was fixed at .05 level.

By using Two Way Analysis of Variance it was found that there was significant difference among Normal Group, Early Group, Late Group, and Irregular Group in Angular Hitting and Stopping skill performance during different time of day. Similarly significant difference was found among Normal Group, Early Group, Late Group and Irregular Group in Pass Receiving, Dribbling and Hitting skill performance during different time of day. Two
way analysis of variance also reveals that there was a significant difference in Dribbling and Goal Shooting skill performance during different time of day.

**Conclusions**

Within the limitation of the present study and on the basis of the findings, the following conclusions are drawn:

1. In Angular Hitting and Stopping; Pass Receiving, Dribbling and Hitting and Dribbling skill performance, Normal Group had shown superior performance as compared to the other selected groups followed by Early Group then by Irregular Group and least performance was shown by Late Group.

2. In Goal Shooting Skill performance, Normal Group had shown superior performance as compared to the other selected groups followed by Irregular Group, then by Early Group, and least performance was shown by Late Group.

3. Similarly, in Angular Hitting and Stopping, Pass Receiving, Dribbling and Hitting, and Goal Shooting skill performance, the best performance had been shown between 4.00 pm. - 5.00 pm. among the four selected timings during a day followed by between 7.00 am. - 8.00 am. then between 10.00 am. - 11.00 am. and least performance was shown between 1.00 pm. - 2.00 pm.
4. In Dribbling skill performance, the best performance had been shown between 4.00 pm. - 5.00 pm. among the four selected timings during a day, followed by between 7.00 am. - 8.00 am. then between 1.00 pm. - 2.00 pm. and least performance was shown between 10.00 am. - 11.00 am.

5. In Angular Hitting and Stopping skill performance Late Group showed superior performance between 10.00 am. - 11.00 am. whereas the same group showed least performance between 7.00 am. - 8.00 am., among different groups and different times of day.

6. In Pass Receiving, Dribbling and Hitting from left side skill performance, Late Group showed superior performance between 1.00 pm. - 2.00 pm., whereas the same group showed least performance between 7.00 am. - 8.00 am. among different groups and different times of day.

7. In Pass Receiving, Dribbling and Hitting from right side skill performance, Late Group showed superior performance between 1.00 pm. - 2.00 pm. whereas the same group showed least performance between 10.00 am. - 11.00 am. among different groups and different times of day.

8. In Goal Shooting skill performance, Late Group showed superior performance between 10.00 am. - 11.00 am. whereas the same group showed least performance between 7.00 am. - 8.00 am. among different groups and different times of day.
9. In Dribbling skill performance, Late Group showed superior performance between 10.00 am. - 11.00 am. whereas the normal group showed least performance between 10.00 am. - 11.00 am. among different groups and different times of day.

10. The result of the study showed that there is a influence of biorhythm in the mean performance of selected hockey skill performance during different time in a 24 hour cycle.

11. The result of the study also showed that there is a influence of various sleep timings in the mean performance of selected hockey skill performance during a 24 hour cycle.

Recommendations

1. From the finding of the study, it is recommended that normal sleep timing should be adapted for better performance during a 24 hour cycle.

2. It is also recommended that, biorhythm does effect the performance during a 24 hour cycle, hence training programme should be modified according to need.

3. The major sports contest are not evenly distributed over a sufficiently broad span of the day hence it is recommended that both sleep and biorhythm must be taken into consideration while preparing the athletes for these contests.
4. It is recommended that similar study may be done by taking hockey players of different levels and of both genders.

5. A similar study may be conducted on sportsmen of different field of games and sports during a 24 hour cycle.

6. A similar study may be conducted by using same experimental design, collecting data at different periods of the year.