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Chapter V

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

Summary

The purpose of the study was to compare and analyze the variations in physical development, health related physical fitness and motor performance between deaf and dumb and normal boys of 12 to 15 years. Six hundred boys of 12 to 15 years of age consisting of deaf and normal hearing were selected as subjects. A sample consisting of 75 boys belonging to each age group was taken from both the population, thus adding to a total of 300 in each age group. The subjects were taken at random from various educational institutions of higher primary and higher secondary level of Karnataka State. The physical development of the subjects were measured by height and weight, the health related physical fitness was assessed with aerobic fitness, body composition and flexibility. And the motor performance variables such as speed, explosive strength, muscular endurance and agility were taken for the purpose of the study. One way analysis of variance (ANOVA) followed by least significant difference (LSD) post hoc test were used for comparing the physical development, health related fitness and motor performance of different age groups. Student ‘t’ test was applied to find out the
significance of difference between the means of the normal and the deaf and dumb boys of four different age groups.

The analysis of physical development, mainly, height and weight of the normal hearing and deaf and dumb showed linear improvement. A sudden spurt in height was observed in normal boys after the age of 14 years where as the deaf and dumb boys exhibited it slightly earlier than 12 years up to 14 years. Increase in weight was observed in the case of normal boys after 13 years, but in the case of deaf and dumb boys this spurt was observed after 12 years.

The age wise comparison of physical development of the normal and deaf and dumb subjects, revealed a non-linear trend. At the age of 12 and 13 years, normal boys were superior in height but lesser in body weight. At the age of 14 years, deaf and dumb boys showed better height and weight compared to normal counterparts. At the age of 15, the height was almost same in both the groups, but normal boys were slightly taller than the deaf and dumb counterparts. As far as weight was concerned, the deaf and dumb boys continued their supremacy in all the age groups.
The findings pertaining to health related physical fitness variables such as body composition, aerobic fitness and flexibility revealed the following results among and between the normal and deaf and dumb boys of 12 to 15 years.

The body composition of the subjects had shown a linear increasing trend in accumulating the body fat. Both the groups have shown this trend and it was parallel to the increase in their body weight.

In the case of body composition, except in the age of 13 years, the deaf and dumb and normal boys were found equal in the percentage of body fat.

The absolute maximal oxygen uptake capacity of normal boys had shown constant improvement throughout the ages of study. But in the case of deaf and dumb boys improvement was continuous up to 14 years. A deterioration trend was visible in the case of absolute VO$_2$Max of deaf and dumb boys after 14 years.

The absolute maximal oxygen uptake capacity was found significantly different in all the age groups except in 15 years between the
normal and the deaf and dumb boys. In all the age groups, deaf and
dumb boys found superior to the normal boys.

The relative maximal oxygen uptake capacity (Relative VO$_2$ Max)
had shown an increasing trend at the age of 12 years in the case of normal
boys and afterwards a decreasing trend was visible. Where as deaf and
dumb boys had shown a decreasing trend throughout the ages.

The relative maximal oxygen uptake capacity was similar between
normal and deaf and dumb at 12 years of age. At 13 years, normal boys
were found superior to deaf and dumb boys. At 14 years and 15 years
both groups were found equal in relative maximal oxygen uptake
capacity.

The flexibility of both normal as well as deaf and dumb boys were
similar in nature. Both the groups did not exhibit any significant
difference in flexibility through out the ages under study.

As far as flexibility was concerned, both the groups were found
equal in all the age groups. No significant differences were found
between the normal and deaf and dumb boys in any of the age groups.
The findings pertaining to the selected motor performance variables such as speed, explosive strength, agility and muscular endurance both the groups had shown similar linear trend of improvement throughout the ages under the study.

In speed, endurance and agility normal boys were found superior in performance throughout the ages. Only in the case of muscular endurance, the deaf and dumb boys superseded the normal boys at the age of 14 and 15 years.

Conclusions

With in the limitations of the present study and on the basis of findings, the following conclusions may be drawn.

1. In physical development, the normal hearing and deaf and dumb boys of 12 to 15 years showed linear improvement. The deaf and dumb boys exhibited early maturity compared to their normal counterparts.

2. The age wise comparison of physical development revealed that, at the age of 12 and 13 years normal boys were superior in height but lesser in body weight. But at the age of 14 years, deaf and dumb
boys had better height and weight compared to normal counterparts.

3. In health related physical fitness, the normal hearing boys had shown constant improvement in absolute maximal oxygen uptake capacity throughout the ages. But in case of deaf and dumb boys improvement was constant up to 14 years, and a minute deterioration trend was visible after 14 years.

4. In absolute maximal oxygen uptake capacity, in all the ages deaf and dumb boys were found superior to the normal hearing boys.

5. In relative maximal oxygen uptake capacity, the normal boys exhibited an increasing trend at the age of 12 years and afterwards, showed a decreasing trend. Whereas the deaf and dumb boys had shown decreasing trend throughout the ages.

6. The relative maximal oxygen uptake capacity was similar between normal and deaf and dumb boys at 12 years. Only at 13 years, normal boys were superior to their counterparts and at 14 and 15 years both the groups were found equal.
7. The flexibility of normal as well as deaf and dumb boys of 12 to 15 years were similar in nature and no difference in flexibility was found between normal hearing and deaf and dumb boys.

8. The body composition of both the groups had shown a linear increasing trend in accumulating the body fat. Except at 13 years, the deaf and normal boys were found equal in the percentage of body fat.

9. In the motor performances, both normal and deaf and dumb boys of 12 to 15 years had shown similar linear trend of improvement throughout the ages.

10. In speed, endurance and agility normal boys were found superior throughout the ages to their counterparts. Only in the case of muscular endurance, the deaf and dumb boys superseded their normal counterparts at the age of 14 and 15 years.

**Recommendations**

In the light of the findings and the conclusions drawn, the following recommendations are made.

1. Overall motor performance of hearing impaired boys will vary in comparison to their peer group. This is evident in terms of
physical fitness as well as motor abilities. Because of variability in physical and motor performance among the deaf and dumb boys, it is especially important to assess the individual's level of function and provide a developmental physical education programme, based on individual needs.

2. Often, the motor speed of hearing impaired boys is characterized by slow movements. Since, deaf and dumb boys may manifest difficulties with the concept of fast and slow, the physical education teachers, should use signals or activities that emphasize difference in speed and time.

3. Establishing communication is vital in developing the physical education programme and socialization process for the development of deaf and dumb boys

4. The deaf and dumb boys, the physical education teacher may select activities that require the least amount of verbal communication and should integrate students with hearing peers.

5. The deaf and dumb boys may experience difficulty in expressing their thoughts and emotions as well as interpreting various expression and gestures. The physical education teachers may
develop non verbal communications, hand signals or cues which will enable the deaf and dumb boys to understand the concept.

6. The deaf and dumb boys usually exhibit hyperactivity due to their inability to receive auditory cues. To control this, yoga, relaxation techniques and active games may be incorporated in the physical education programme.

7. The deaf and dumb boys normally have body balance problem. Hence, rhythmic activities may be included in the physical education programme.

8. Similar studies may be conducted on different age groups, which are not carried out in this study.

9. Similar type of study may be conducted by taking subjects from different parts of the country and other categories such as physically handicapped, blind and children with various retardations.

10. Similar study may be conducted on female subjects.