

CHAPTER V

CONCLUSIONS, FINDINGS AND RECOMMENDATIONS

5.1 Over all conclusions

Healthy society is a wealthy society and children are the important components of the society. The incidence of overweight and obesity among children of Tirunelveli city is (14%) higher than the national average in 2003. The incidence of overweight and obesity are very high among males (14.2%) who are within the age group of 13-17 years. In female the obese percentage observed was 12.8%. The obese persons identified in the present study hail from economically sound families, which is a nuclear one in which both the parents are earning members. Both the parents are literate, mostly professionals or business magnets of the town. Since these obese students hail from rich family they enjoy all sorts of sophistication in home as well as outside and this leads to immobility, resulted in obesity. They consume energy rich, fat rich diet that further aggravates the status of obesity.

Another major cause of obesity is decreased physical activity. Most of the overweight and obese children have sedentary behavior with less physical activity. There is lack of physical activities both in school and within the home environment. Technological advancement has caused this factor together with the security risk that the children are exposed to whenever they are away from home. Walking activity is limited or totally nil most of the affluent students use vehicle for their mobility. The inadequacy of facilities where children can safely engage in physical activities, both in school and in the community, use of vehicles and other sophistication further aggravate the problem. Technology has contributed many wonderful conveniences

in our society but at the expense of creating a remarkably sedentary lifestyle with no end in sight.

5.2 Overall findings

The present study focused on the school children of Tirunelveli opens a lot of unknown fact to the society. The study observed a lot of physical, physiological, biochemical studies among the school children. The various findings are briefly reported in this chapter.

- ❖ In the present study the relevant information is collected from 350 students of affluent group and 510 students of non-affluent group between the ages of 13-17yrs.
- ❖ The study included both the sex in equal number (430 each) with the representatives of all age group and also the sample represented members from the aided, municipal (non-affluent) and matriculation (affluent) schools.

5.2.1 Assessment of obesity

- ❖ The prevalence of obesity observed in the present study was 13.5% and it was very close to the worldwide observations but it is alarmingly higher than the results of the national survey conducted by the National Health Evaluation Survey during 2003 which is only 4.9%.
- ❖ The occurrence of obesity among boys was high (14.2%) than the girls (12.8%).
- ❖ The obesity and overweight students are very common among the affluent school students and their percentage (24%) is in an alarming state.
- ❖ Among the non-affluent school students the underweight and severe underweight categories was common. This category was predominantly observed among the students of (61.9%) Municipal school.

- ❖ Among the underweight students severe underweight was more common among boys (24.1%) than the girls (14.5%).

5.2.2 Blood hematology and blood biochemistry

- ❖ The hematological parameter is a precious tool in identifying the health status of an individual. In the present study the various blood parameters studied among the students showed the following results.
- ❖ The increased percentage of hemoglobin and RBC content was very prominent among matriculation school students than the aided school and municipal school students.
- ❖ Apart from the hemoglobin content and RBC count, the other hematological indices such as PCV, MCV, MCH and MCHC also showed much variation in the studied obese student community than the control.
- ❖ The WBC count among obese students showed several numerical variations in the differential count. Except the eosinophil count and lymphocyte count, in case of obese and overobese students of both sex and all other observed parameters showed similarity with the values of the control population.
- ❖ The elevated glucose level observed among the overweight and obese students observed in the present study was very high (19.9% to 34.2% in boys and 13.5% to 26.8% in girls ($P < 0.05$) in aided school students than the matriculation school students.
- ❖ The increases of creatinine observed among obese and overobese students are significantly high in case of aided school students in both sexes than the matriculation school.

- ❖ The increase of calcium level was significantly ($P < 0.05$) very high among aided school students (11.7% to 24.5% in boys and 8.3% to 13.5% in girls) than the matriculation school students.
- ❖ The increase in sodium level was 0.5% to 1.7% in both the sexes.
- ❖ The increased sodium and chloride level observed are comparatively high in aided school student of both sex then the matriculation and municipal school students.
- ❖ There was no significant difference in the potassium level of the students of aided school, matriculation school and municipal school.
- ❖ The increased percentage of total cholesterol observed among the obese was very high in matriculation school students than the aided and municipal school students.
- ❖ The level of triglycerides steadily increased ($P > 0.05$) in case of overweight, obese and overobese students of both sexes when compared to the control.
- ❖ The fall in the HDL level ranges from 25.7% to 30.1% in boys and 24.6% to 29.9% in case of girl students.
- ❖ In the present study the LDL and VLDL level steadily increased ($P > 0.05$) among the overweight, obese and overobese students of both sexes. The increase in values are much prevalent among the matriculation school students than the aided and municipal school students.

5.2.3 Blood pressure

- ❖ Among the studied students of both sex irrespective of age, about 71% have normal blood pressure, whereas the remaining 29% have abnormal blood pressure.

- ❖ When compared to the municipal school students, the obese students of both the sexes of the aided school and matriculation school have a significant increase in their systolic and diastolic pressure.
- ❖ Among them the low blood pressure level observed showed a fall percentage of 8 to 18% in both the sexes.
- ❖ Prevalence of high blood pressure was very high among the obese students of matriculation schools than the aided and government school students.

5.2.4 Socio-economic status

- ❖ The parental socio-economic status differed to a greater extent. Among the studied group 19.9% belong to low income group, 38.5% belong to middle income group and 41.6% belong to high income group.
- ❖ The prevalence of obesity observed among the students was 4.1%, 8.2% and 21.3% respectively among the low, middle, high income group.
- ❖ On the other hand in case of low economic group the percentage of underweight categories observed was very high (48%) and among this about 16.9% belong to severe underweight category.
- ❖ The educational status of parents showed that 22.2% of parents were illiterate. Only a mere 12.8% of the parents reached upto the level of primary education, 19.5% studied upto secondary and 21.6% upto higher secondary level 13.9% graduation level and only 9.9% studied upto post graduate level.

5.3 Recommendations

Based on the study conducted among the students of Tirunelveli and the experience gained by the researcher during the study the following recommendations are forwarded to manage the problem of obesity and overweight among children:

- The students should be educated with our old traditions, moral ethics, traditional food and culture and its significance.
- The students must be familiarized about the nutritive value of food items, importance of vegetables and fruits, importance of balanced diet and so on.
- The students must be educated about the positive and negative aspects of each food items and they should know what food item they should consume regularly and what occasionally and what should be avoided.
- They must be educated about the table-manners, healthy and hygienic practices.
- Dumping of food into the stomach of the kids by the mothers during early childhood must be strictly avoid, this will later on leads to adulthood obesity.
- Parents should make time for the family to engage their children in sports activities and other regular physical activities like walking or hiking, swimming, and bicycling, Also, they must encourage their children to perform household chores that will make them more physically active.
- In school curriculum the physical education and comprehensive health education should be included to all sets of students. The physical education classes should incorporate aerobic exercises and recreational activities.
- ❖ There should be regular class hours on healthy food habits, nutritive values of different food items, lifestyle and behavioral modification.
- ❖ Teachers should be motivated to explain the health related problems through non-conventional ways like short play, video clips, games and so on.
- ❖ Each student should take part in outdoor games and sports, irrespective of gender and they should monitor his/her anthropometric parameters in their health dairy, at least once in a month.

- ❖ The students should be encouraged to come to schools by walk or cycle.
- ❖ Student should be given the knowledge about the healthy and nutritionally balanced food and other healthy practices.
- ❖ Students must be advised to consume nutritious diet atleast one time a day that will definitely improve their health status.
- ❖ Parents should be advised about obesity problems not only for their children but also for themselves. The parents should be educated with the food and food habits, nutritive values of food, requirement of food, positive and negative impacts of food and so on.
- ❖ The government should take proactive initiative to promote good health awareness program across the civic society.
- ❖ Restriction should be made for advertising fast food or packet foods which are poor in nutritive values in public places.
- Set time limit for daily TV and computer usage and it should not exceed 2 hours per day.