

**EVALUATION OF PHYSICAL GROWTH STANDARDS,  
NUTRITIONAL STATUS AND DIETARY PATTERNS AMONG  
THE SCHOOL AGE-CHILDREN OF HIMACHAL PRADESH:  
A CROSS SECTIONAL STUDY**

**A  
Thesis**

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## 6.1 SUMMARY

### PHYSICAL GROWTH

The mean height of the boys is  $157.5 \pm 13.3$  cm and mean height of the girls is  $150.6 \pm 8.8$  cm. The mean weight of the boys was  $44.7 \pm 12.2$  kg and mean weight of the girls was  $40.1 \pm 9.20$  kg. Both height and weight showed a progressive increase with age from 10 to 17 years.

The highest gain in height among boys (9.8cm) was reported at 12 to 13 years of age groups and among girls (6cm) at 11 to 12 years of the age groups. Up to 12 years girls were taller than boys and after the 13 years age boys were found to be significantly taller than girls. Major gain in weight for the boys was 6.5 kg from 12 to 13 years, and for the girls it was 5.8 kg between 11-12 years. At 10- or 12-years girls were significantly heavier than boys and after 13 years boy's weight was significantly more than the girls.

The mean height of the boys and girls differ differently when compared to the 50<sup>th</sup> percentile values of the Indian growth reference height of children.

The mean weight of Himachali boys and girls at all age groups were lower than the 50<sup>th</sup> percentile of Indian growth reference standard.

### MALNUTRITION

Majority of the boys and girls at all age groups were normal. The overall prevalence of stunting among boys was 7.5% (Percent) and among girls 9%.

The prevalence of thinness was more than among the boys (19%) as compared to the girls (12%). The overall rates of severe thinness were almost similar in boys (4.2%) and girls (5%).

Overweight was slightly more among boys (6%) as compared to the girls (5%). While overall prevalence of obesity among boys was 2% and among girls 3%.

Comparative prevalence of malnutrition among the whole group of boys and girls showed that stunting was higher in girls as compared to boys (7.3 % in girls vs 5.7% in boys). Thinness was slightly higher among boys (17.5 % in boys vs 16.2 % in girls). The stunted- thinness was minimum and almost similar in both sexes. Overnutrition is statistically significantly higher among boys (7.7 %) than girls (4.3 %).

## **6.2 DIETARY PATTERN**

### **BREAKFAST PATTERN**

Most of the children, 88% of boys and 75% of girls and more early adolescent children of both sexes showed regular breakfast as compared to their late counterpart.

### **HEALTHY FOOD CONSUMPTION**

Almost 90 percent or more boys and girls reported that they have consumed the different healthy food items “at least once a week”.

Higher consumption of green leafy vegetables, dairy products, milk and salad was reported by a significantly more number of girls than boys.

In both gender, fruit, green leafy vegetable and salad consumption was more in the late group while milk consumption was more in the early group.

### **UNHEALTHY FOOD CONSUMPTION**

Majority of the boys and girls in different age groups (70.6 – 87.0%) reported that they consumed the different unhealthy food items “few days a week”.

A significantly higher percentages of boys reported high consumption of sweet and soft drinks while significantly higher percentages of girls reported high consumption of savory snacks, fast foods and candies and chocolates.

### **MEAL PATTERN**

Vegetarian pattern was more among girls, 65.7 % girls, while distribution of veg and non-vegetarian meal pattern was almost equal among boys (50.3 % vegetarian vs 49.7 % non-vegetarian).

## **6.3 DIET AND MALNUTRITION**

### **BREAKFAST PATTERN AND MALNUTRITION**

Irregular breakfast pattern significantly associated with stunting, thinness and overnutrition in both boys and girls.

### **HEALTHY FOOD CONSUMPTION AND MALNUTRITION**

Among the healthy foods, lower consumption of fruit and cooked vegetables were associated with stunting among girls, however, lower consumption of none of the healthy food items were associated with stunting in boys.

Lower consumption of fruit was associated with thinness among boys. Lower consumption of fruit, dairy products and cooked vegetables were associated with thinness and girls.

Lower consumption of fruit was associated with overnutrition among the girls, while consumption of none of the healthy foods were associated with overnutrition in boys.

### **UNHEALTHY FOOD CONSUMPTION AND MALNUTRITION**

High consumption of savory snacks, fast foods and soft drinks were significantly associated with stunting and thinness and overweight among boys. Higher sweet consumption is also associated with overnutrition among the boys. Only fast food consumption was associated with overnutrition among the girls.

### **6.4 CONCLUSION**

Problems relating to food intake and malnutrition have been identified as widespread concern for public health worldwide. Therefore, emphasis has been placed to identify the extent of malnutrition as a consequence of dietary habit in different population group. The present study is an endeavour in this effort. This study has sought to focus on the nutritional status and dietary pattern of school going children in the urban and peri-urban areas of Himachal Pradesh for specific reasons. Firstly, they represent the most advantaged and as well as the most vulnerable group of the society and secondly, their nutritional health status will determine the well-being of next generation. Any interventions design to have a long-term impact on the health of the country must take into consideration the health status of adolescent. This reflects the importance of the present study.

The present study has generated a substantial amount of information on the nutritional and dietary pattern of the Himachali children which can be used as a reference while developing suitable population specific health and nutritional policies. As compared to different parts of India, the results obtained in the present study were quite impressive and revealed a positive deviance in the lifestyle approach of the Himachali children that are mainly dictated by cultural preservation of the communities coupled to minimum infiltration of urbanization. These facets can also be implemented as a strength-based approach to bring positive behavioural and social change to improve the health and nutritional condition in other population setting.

## 6.5 RECOMMENDATIONS

The present study makes the following recommendations towards the development of healthy food choice and practices among children and adolescents of Himachal Pradesh.

### **Implementation of Nutrition Education Programs:**

**In the present study, it has been reported that majority of the boys and girls (70-87%) consumed different unhealthy food items. So these children can be educated by providing nutrition education programs** in schools to raise awareness about healthy eating habits and side-effects of unhealthy foods and its related problems in the future. These, programs could include workshops, seminars, and interactive sessions to educate both; students and parents on the importance of a balanced diet, healthy food choices and regular meal practices.

### **Integration of Nutritional Modules in School Curriculum:**

The study proposes integration of nutrition-related modules into the school curriculum to ensure that students receive consistent and structured education on nutrition, helping them develop informed dietary choices from an early age.

The nutritional module may also include a regular monitoring and assessment system to track changes in nutritional status and eating habits over time. This will help to evaluate the effectiveness of implemented interventions.

### **School Meal Improvement Initiatives:**

The study advocates for improvements in the nutritional content of school meals by collaborating with relevant authorities to enhance the quality and diversity of the meals provided, ensuring they meet the nutritional requirements of growing adolescents. Secondly, it has been seen in the present study that fast food items are easily available to the students outside the school campus. So initiative should be taken by the school authorities, not to allow easy accessibility of such food-items to the children during school hours.

### **Parental Nutritional Education:**

The study recommends workshops or seminars on nutritional education for parents so that they can become aware of different barriers and possibilities of healthy nutritional practices. These programmes can also equip parents with the knowledge and skills needed to support their children's nutritional needs at home.

**Promotion of Physical Activities:**

The study strongly recommends the development of extracurricular programs that will encourage regular physical exercise among school children, in conjunction with a balanced diet to promote overall health and well-being. Study results showed the prevalence of undernutrition among both sexes, which can be improved with the government supported systems such as fortification programs. So, this study strongly recommends the government of Himachal Pradesh to take initiatives or to develop strategies to meet the nutritional requirements of the school-going children of Himachal Pradesh.