Chapter 5

Summary and Conclusion

This chapter furnishes the summary and conclusion of the study entitled “Nutritional Profile and Impact of Nutrition Counseling on the Nutrition Knowledge, Mental Capacities and Physical Activity Level of Selected School Going Children of Kochi”.

Nutrition is important for everyone, and it is more important for children because it is directly linked to all aspects of their growth and development, factors which will have direct ties to their level of health as adults. Both nutrition and diet are vital determinants of the health and nutritional profile of children. The nutritional status of a child is often the result of many interrelated factors and is influenced by food intake, its quantity and quality, and physical health.

School going children go through remarkable physical changes of all kinds; their food intake becomes a critical aspect for the growth and development. Children of school going age constitute a highly vulnerable and important group. During their growing period, care should be taken to include all the nutrients in their diet. Nutrition affects the overall development of the child for which a balanced diet has to be followed. Proper nutrition can also prevent many medical problems, including becoming underweight, developing weak bones, and degenerative diseases. It will also ensure that the child physically grows to his/her full potential.

The school going age is a dynamic period of physical growth and development, when children undergo mental, emotional and social changes. Nutritional problems not only affect school going children growth and
development but also affect future adversely. A balanced diet suitable of protein, vitamins, and minerals will be good for a school age child.

The foundation of good health and sound mind is laid during the school age period. Children who fail to grow optimum during this crucial period may not make-up the loss in growth even on excellent diet in later life. Good nutrition is important throughout childhood because under nutrition during the first few years of life decreases adult body size and physical output when the growth rate is high. The high level of nutritional deprivation combined with heavy burden of disease at young age has negative consequences which will be expressed during adult life.

India is one among the many countries where child malnutrition is severe and also malnutrition is a major underlying cause of child mortality in India. The problem has caught the attention of policy makers and researchers for several decades. Various studies and surveys have been conducted to find out the root causes of child malnutrition. All these studies including the three National Family Health Surveys (NFHS) reveal that malnutrition is not the result of a single cause; the problem is multifaceted, the causes acting singly or in combination with other complex factors like poverty, purchasing power, health care, ignorance on nutrition and health education, female illiteracy, social convention etc.

Despite Kerala having the best indicators on child development, certain disturbing trends have emerged in recent years affecting this developmental status, especially in the child population. Although a majority of children in Kerala are underweight, the State is fast catching up with the West in child obesity, and unless addressed on the family and social fronts with seriousness, Kerala could soon be faced with yet another health-care challenge. Obesity and malnutrition among children are two ends of the spectrum. The overall
prevalence of obesity is 2.2 per cent. According to NFHS 3 (2005 – 2006) children suffering from malnutrition is 40.79 percent, of this 30 percent are underweight children, 33.8 percent children are having stunted growth, 4.5 percent children showed prevalence of Iodine deficiency disorders, 23 percent adolescent girls are anemic and 0.1 percent blindness is due to Vitamin A deficiency.

The study was undertaken with the following objective:

1. To assess the nutritional status of the selected school going children,

2. To find out the impact of nutrition counseling on the nutrition knowledge, mental capacities and PAL of school going children, and

3. To determine the effect of nutrition education on the KAP of the mothers of the selected school going children.

The subjects for the study were selected from Assisi Vidyanikethan Public school, Kakkanad, Kochi and St Joseph Higher Secondary School, Piravom, Kochi. The schools were selected to represent both Urban and Rural area. Out of a total of 1058 children, 265 boys and 251 girls were from rural area and 304 boys and 238 girls from urban area who participated in the study. Cluster sampling method was used for the selection of subjects. Both urban and rural children in the age group of 10 – 12 years who had regular attendance in school were selected for study. Information pertaining to general aspects and socioeconomic status were collected by direct interview method. 24 hour dietary recall method was used to collect information on quantity of food intake. Nutrient intake was calculated and compared with the recommended dietary allowances. All the children were tested for nutrition
knowledge, mental capacity and physical activity with a pre tested questionnaire. Nutrition counseling was carried out to the children as well to the mothers using power point presentations, food festivals and audio visual aids for three months. After counseling, the same questionnaire was used for post testing to find out the difference in the intervention. The KAP of the mothers were also tested before and after counseling.

**The results of the study are summarized below:**

- A greater percentage of males (53.8%) participated in the study. Out of them 265 boys (51.36 %) and 251 girls (48.6%) were from rural area, and 304 boys (56.9%) and 238 girls (43.9%) from urban areas. Boy’s outnumbered girls in the urban area while as it was the reverse in the rural area.

- 48.4% of the selected boys were 10 years old and 51.6% girls, 50.9 % boys and 49.1% girls were 11 years old, and 62.1% boys and 37.9 % girls were12 years of age. Out of them, 30.6 % who were 10 years old, 34.88% who were 11 year old and 34.5 % who were 12 year old were from the rural school and 33.76% of 10 years old, 35.2% of 11 years old and 31.0 % of 12 years old were from the urban school.

- A greater percentage (75.3%) was Christians, 14.7% were Hindus, 9.8 % were Muslims and 0.2 % belonged to other religions.

- 66.9 % of the children studied were from nuclear family and 33.1% from joint family. Out of them, an almost equal distribution of the children from both rural (31.1%) and urban areas (35.06%) belonged to joint families, 69% (rural) and 65 % (urban) belonged to nuclear families.
• 70.3 % of the children from rural areas were from the Lower/Upper lower class and 29.70% from the Middle/Lower Middle Class and none of them were from the Upper Middle class. 69.60 % of the children from the urban areas were from the Upper Middle Class and only 30.40% were from Middle/ Lower Middle Class and none from the Lower/ Upper Lower Class.

• 50.4 % of the selected children from rural area and 93.4% of the urban area were non vegetarians. The consumption of non-vegetarian diet was less in rural area due to poor economic status and non-availability of these diets. 4.3% of the children of rural area and 3.1% of the urban area were vegetarians. It is also interesting to note that 45.3% of children from the rural areas and 3.5% from urban areas were lacto ova vegetarians.

• The caloric intake ranged between 1389.33 kcal and 1644.84 kcal /day, the protein intake between 36.31 gm and 39.72 gm per day, calcium between 277.32 mg and 529.52 mg per day and iron intake between 11.49 mg and 14.81mg per day in both urban and rural area. This was far below the ICMR 2010 recommendations of dietary allowances of Indians. This will result in nutritional deficiency and growth. Therefore it is absolutely essential to educate the children as well as their mothers who cook the food for the family on the importance of nutritious foods.

• Skipping meals can be considered as an unhealthy eating behavior. A greater percentage (53.9%) of the children of rural area skipped meals. Regular habit of skipping meals, long time inadequate intake of essential nutrients will lead to nutritional deficiency diseases. 53.90 % of the rural and 44.50 % of the urban children skipped meals. The findings of the present study also indicate that constraints like lack of
time as the major reason for skipping, apart from mothers not having the time and a monotonous type of breakfast preparation.

- 95.90% of children from rural and 87.50 % urban area always enjoyed home food. Restaurant meals tend to have more fat, sugar, and salt and it should be saved only for special occasions. Restaurant meals will not supply the nutrient needs of the school going children. 93.60% of the children from rural and 43.50 % of the urban area children did not like eating at restaurants.

- 10.7% of the school children from the rural area were severely underweight (3rd percentile or -3 SD), and 51 (9.4%) were obese from urban area (97th percentile or +3 SD) 322 (62.4%) were underweight (15th percentile or – 2 SD) from the rural area while 93 (17.15%) were overweight among the urban area (85th percentile or +2 SD). Also 143 (26.38%) from urban area (50th percentile) and 100 (19.4%) from rural area were normal.

- The mean BMI for age and height for age of the selected school children of both the sexes and areas was far below the WHO standards. The BMI for age of girls was almost the same as that of WHO, however, that of boys was much below WHO standards. The height for age of both the selected boys and girls of the study was lower than WHO standards.

- No major clinical signs suggestive of any nutritional deficiency were noted, however dental caries was predominant in the children of both urban and rural areas. 16.40 % of the children from rural area and 19.00 % from urban area had marked dental caries and 11.80% from rural area and 16% from urban area had mild dental caries whereas
83.50 % of children from rural area and 87.20 % urban area did not have dental caries.

• The nutrition knowledge of 499 children out of 1058 children was low before counseling, but after counseling, 80.8 % were upgraded to medium level and 15.2 % to high level and only 4% remained at low level. At the same time only 115 children were graded as high before counseling, while after counseling it rose to 378.

• The results of mental capacities indicate that a greater percentage (72.11%) of the selected children were in grade 3 in the pre counseling session while in post counseling there were only (39.89%). It is also important to note that none of the children were in grade I in the pre counseling session while (38.47%) of the children were in this grade in the post counseling session. Likewise the number of children (9.27%) who were in grade 4 in the pre counseling session improved after counseling. Two percent of the selected children were in grade 5 in the pre counseling session, while none were in grade 5 after counseling.

• The results of the physical activity level show that 794 out of 1058 were in the category of low physical activity before counseling while after counseling none of the children fell in this category. Two hundred and four children were in the medium physical activity level before counseling while after counseling there was an improvement to 479. The number of children in high physical activity level was 60 before counseling which rose to 579 after counseling.

• A tremendous improvement on knowledge, attitude and practice of the mothers on account of nutrition counseling was seen. 53% of the mothers were rated as poor (knowledge) before counseling, while after counseling none of them were in this category. Only 13.7% of the
mothers had “high knowledge” before counseling and this rose to 38.37% after counseling.

The dramatic improvement observed in the study is due to the interaction that occurred between the school going children and researcher. The study also showed that only a relatively short period of counseling (3 months) with excellent audio – visual aids helped to increase the school going children’s nutrition knowledge and ability to understand the nutrition aspects and improve the mental capacity and physical activity level. The results also suggest that nutrition counseling will help to facilitate the consumption of locally available nutritious foods and providing a healthy foundation for the future.

Kerala is a highly literate state and having the best indicators in the Human Development Indices when compared to the other states of India. The Kerala Model Development with limited resources is well recognized and appreciated all over the world. Even in a state like Kerala, malnutrition exists which can easily be corrected by imparting nutrition counseling to both children and parents. The researcher has identified malnourishment and deficit in the nutrient intake in such a state on account of poor knowledge which improved after nutrition counseling. The investigator recommends that such similar and intensive measures can be taken by the other states of India.

The results indicate a significant impact of nutritional counseling on the nutrition knowledge, mental capacity and PAL of the children, as well as on the KAP of the mothers. Clearly, it is important to inculcate such quality nutrition education at an impressionable age and sustain the same throughout the school age.

A child’s nutrition knowledge comes from both the family and the school. This emphasizes the need for imparting nutrition and health education to both the children and the family members (mothers).
Recommendations

1. Nutritional assessment should be carried out regularly in the school going age.

2. Schools should conduct regular nutrition education classes for the parents and children with the help of a nutritionist.

3. Schools should encourage healthy snacks/food for lunch.

4. Apart from mid-day meals, the government may consider providing balanced nutritious snacks at least in the rural areas.

5. The school should provide opportunity for the children for regular physical activity during school hours.