CHAPTER III

METHODOLOGY
Overall Aim of Study

The present study was undertaken as an action project with the aim of developing strategies and modules which can be used for nutrition education of school children within the school setting.

Selection of the School

Gurukul is a day-boarding school in Pune affiliated to the CBSE Board. It catered to approximately 200 children (from Primary and Secondary school) at the time of initiating this study. The school is run by Saraswati Education Society, and is specially designed to address the concerns of working parents. Majority of the students enrolled belong to upper middle and higher income groups. The school aims at happy interactions between the parents and the children, by taking care of the children for the entire day, including three meals a day. Also children complete their homework in the school itself. Thus all children from pre-school to the X standard remain in the school premises from 9.00 am to 5.00 pm, five days in a week, and it is compulsory for all the children to partake of the meals provided to them. No child is allowed to bring any eatables from home. The School Principal and the Society members are committed to serving nutritionally balanced, simple vegetarian meals/snacks that are not spicy or have a high fat content.

Background of the Study

The school has a Food Committee which periodically monitored the meals served to the children. Issues regarding taste of the food, variety and inadequate quantity were regularly brought up by parents and children, during parent-teacher meetings and brought to the notice of the Food Committee. On the other hand, the concerns of the School authorities were food safety, plate wastage and over-consumption of ‘liked foods’ which were generally energy-dense. The Management was concerned about the long-term
implication of such emphasis on food intake, including the possibility of obesity. Therefore the school authorities sought the help of a qualified Nutritionist (the investigator) to educate children regarding nutritive values and benefits of nutritionally balanced meals which would meet the nutrient requirements of the children and yet meet the taste requirements of the children. The school authorities also wanted the help of the nutritionist, to address the special needs of some children who had problems like food allergies, intolerances of some foods and problems like rectal prolapse, nephrotic syndrome. Hence, this action study was launched in order to make an attempt to address the various concerns of the school management.

**Design of the Study:**

The Principal of the School approached the Nutritionist to provide nutrition education suitable for all the standards so that the children learn to eat simple, nutritionally balanced food. She was also keen on monitoring the growth of children as a sequel to above. She and the Management gave the necessary freedom to the investigator to plan the menus, and design various nutrition education modules suitable for children of all age groups, parents and teachers.

Nutrition education modules were designed to address the concerns mentioned above. The taste of meals was modified as per the inputs given by the Food Committee of the school, which comprised of teachers and parent representatives. Hygiene and food were also addressed and monitored during the food preparation and food service. The investigator launched the study in 2000-2001 at Gurukul School, and all children enrolled in the school were included in the study. Parents were given a brief outline of the nature and purpose of the study during the academic year. The design of the study is depicted schematically in Figure III – 1.
Formulation of Nutrition Education Project

- Self Appraisal Forms for children.
- Anthropometry for children.
- KAP, FFQ Forms for Parents.

ANALYSIS OF BASELINE

PHASE-II

NUTRITION EDUCATION FOR CHILDREN

IMPROVEMENT OF SCHOOL FOOD SERVICE

NUTRITION EDUCATION FOR PARENTS AND TEACHERS.

SERIES OF ACTIVITY BASED & INTERACTIVE CLASSROOM SESSIONS FOR CHILDREN PRESCHOOL TO STD. V

SERIES OF WORKSHOPS FOR PARENTS AND TEACHERS.

PHASE III
POST TEST, STATISTICAL ANALYSIS, RESULTS.

NUTRITION EDUCATION CONTINUES

Figure III -1: Design of the Study
The forms were analyzed and from the responses given by mothers, gaps in the nutrition knowledge, food practices and exercise habits of parents and children were ascertained. This was used as the basis for formulation of interventions which involved development of suitable nutrition education modules for children, parents and teachers.

Nutrition education modules were designed to address the following issues/concerns –

- Improvement in nutrition knowledge of children, parents and teachers
- Enabling selection of foods based on food pyramid as well as practical preparation of small portions
- Sensitizing children and parents about the importance of eating balanced meals for normal growth
- Sensitizing children and parents about the need for limiting the ‘servings’ of energy dense foods
- Creating awareness about the importance of eating moderate fat, high fibre foods
- Sensitizing children about the role of physical activity in maintaining good health
- Teaching children to modify the foods of their choice in order to make them nutritionally appropriate e.g. lower fat and/or increase the fibre content
- Teaching children to plan menus for themselves and including all food groups
- Creating awareness among parents and older children about impact of TV advertisements on selection of foods
- Causes and consequences of childhood obesity

Most of the sessions for children, parents and teachers were planned and conducted by the investigator herself. However for parents and teachers, talks by leading physicians were organized in order to reinforce the messages and to impress upon the parents, the need to consider these issues seriously. Further, teachers, physicians and for some issues other institutions e.g. a local college was involved.
**Phase I – Baseline (2000-2001):**

The following activities were carried out in this phase:

a) Filling up of self-Appraisal forms by children (Std I to IV – personal interviews and data filled by the researcher)

b) Detailed information about study given to parents followed by filling up of KAP and Food Frequency questionnaires by mothers

c) Children’s anthropometry – height and weight for all classes in Pre-primary, Primary and Secondary.

d) Estimation of children’s hemoglobin and general physical examination

**Tools Used for Data Collection**

**Phase I:**

During Phase - I of the study in January 2001, parents were asked to fill up two questionnaires (i) to assess the knowledge, attitude and practices (KAP) of the mothers and (ii) a food frequency questionnaire. The questionnaires were explained to the parents and queries answered. Similarly, self-appraisal forms were filled by children, except those in Nursery, Standards I and II, in presence of the Researcher.

1) Self Appraisal Forms filled by children:

[The self appraisal form is shown in Appendix 1(a) – page 340]

Children answered the self-appraisal questionnaire as per the following methodology –

- I and II Standards – children in I and II standard were excluded from filling self-appraisal forms.
• III and IV Standards – children were interviewed in groups of four each, questions were explained to them, and the children wrote down their own responses. The time required was about 35-40 minutes per group.

• V to VIII Standard – children were divided into two groups per class, the questions were explained to them, and the children wrote the answers themselves. The time required was about 30-35 minutes per group.

The self-appraisal form was used to evaluate the eating habits of children. The questions were grouped under the following headings:

- Details of child’s health such as height and weight, oral hygiene, signs of anemia and occurrence of illness. These were carried out by the researcher and a pediatrician during the health check-up.
- Perception of body type
- Food pattern of the child
- Eating habits of child
- Exercise pattern of child

2) Questionnaires for parents:

Parents were called class-wise during the orientation session conducted by the school in June 2001. They were explained the purpose and design of the study. They were asked to fill:

a) A questionnaire on Knowledge, Attitude and Practices of mothers (KAP),

b) Food Frequency Questionnaire (FFQ) for mothers.

These questionnaires comprised both close ended and open-ended questions (these forms are shown in Appendix 1(b) page 345 and 1(c) page 351 respectively). The researcher read out the questions one by one and clarified doubts, if any. The questions in the KAP were grouped under the following broad headings –

108
- Details about the type of family and number of family members.
- Educational qualifications of parents.
- Profession/ occupation of parents
- Questions related to health: height, weight, BMI. Personal and family history of illnesses and diseases
- Exercise pattern of parents and children
- Knowledge about nutrition
- Selected practices regarding nutrition
- Attitude towards fussy habits of child
- Frequency of eating fast foods/ eating out

Mothers completed the forms during the orientation session. On average parents required 40-50 minutes to complete the KAP forms.

b) FFQ for Mothers:

This was used to obtain information about the general eating patterns in families [Appendix 1(c) page 351]. Information was sought on the frequency of eating 57 food items, which were broadly classified into the following groups: cereals and cereal products; pulses and legumes; milk and milk products; non-vegetarian foods; vegetables; fruits; oils/fats; instant foods; fast foods; fresh and tinned fruit juices; soft drinks; high sugar foods; high sodium foods and fried snacks.

Some mothers wanted to carry the FFQ forms due to paucity of time. Most of the mothers filled the form in the school itself, which took about 30 minutes. Parents who took the form home returned the filled forms by end June, 2001.

The sessions were conducted separately for each class and the number of parents who filled forms are shown in Table III-1.
Table III – 1: Profile of Mothers Attending Orientation and Filling Questionnaires

<table>
<thead>
<tr>
<th>Standard</th>
<th>Date</th>
<th>No. of parents attending orientation</th>
<th>No. of KAP forms filled by mothers</th>
<th>No. of FFQ forms filled</th>
</tr>
</thead>
<tbody>
<tr>
<td>IV, V and VI</td>
<td>IV and V - 7/1/2001 VI – 8/1/2001</td>
<td>83</td>
<td>74</td>
<td>51</td>
</tr>
<tr>
<td>VII and VIII</td>
<td>8/1/2001</td>
<td>51</td>
<td>47</td>
<td>32</td>
</tr>
<tr>
<td>Pre-primary</td>
<td>9/1/2001</td>
<td>81</td>
<td>75</td>
<td>46</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>292</td>
<td>267</td>
<td>175</td>
</tr>
</tbody>
</table>

The data from the questionnaires and the self appraisal forms were analyzed to identify the topics for interventions.

3) Anthropometric measurements of children:

These were taken once in six months since the Principal was interested in starting a growth monitoring programme for the children.

a) Weight – Weights were recorded in the morning. Children wore only their school uniforms, and all other accessories were removed and kept aside. A standardized digital weighing scale accurate to 100 g (Glass Electronic Personal Scale, ESS 2101) was used. Children were made to stand in the center of the scale with the body weight distributed evenly on both feet, without touching anything else. Two readings were taken for each child and the average weight was calculated.

b) Height – Height was taken with the help of a standardized measuring tape fixed to the wall. Children were asked to remove their shoes and socks, and made to stand on a flat floor by the tape with feet parallel. The heels, buttocks, shoulders and back were upright and touching the tape. The arms were hanging by the sides in a natural manner. A 12” ruler was used to press the hair and make contact with the top of the head as described by Jelliffe( 1966). Height was recorded to the nearest 0.1cm.

c) Physical examination was done by a pediatrician.
Phase II - 1(2001-2002):
Phase II of the study was launched in June 2001. The outline of activities included in this phase is given in Figure III - 2.

The interventions undertaken in Phase II are briefly outlined according to year and target group, year-wise. Each module is described in detail in Appendices 2 and 3. The interventions for parents and teachers are summarized in Table III - 2, and for children in Tables III - 3 to III - 7.

OUTLINE OF ACTIVITIES IN PHASE-II

Figure III – 2: Outline of Activities in Phase II
Interventions for Parents:

Table III - 2 summarizes the sessions carried out for parents and teachers.

<table>
<thead>
<tr>
<th>Year</th>
<th>For Parents</th>
<th>For Teachers</th>
</tr>
</thead>
<tbody>
<tr>
<td>I (2001-2002) June, 2001</td>
<td>Series of interactive Workshops on ‘Know Your Heart Risk’ conducted standard-wise for all parents. Each workshop lasted for more than 90 minutes (n = 348) Photograph 1 – Appendix 4</td>
<td>Workshop on ‘Know Your Heart Risk’ for all teachers. Class-teachers also attended workshops for parents for their respective classes (n = 50)</td>
</tr>
<tr>
<td>II (2002-2003) June, 2002</td>
<td>Interactive sessions for parents conducted standard-wise on ‘Food Pyramid and its use in daily diet’ – emphasis on increasing fiber and reducing fat in the daily diet. Each session lasted for more than 60 minutes (n = 360). Photograph 2 – Appendix 4 Workshop on ‘Know Your Heart Risk’ for the new parents for over 90 minutes (n = 45)</td>
<td>Interactive workshop on ‘Food Pyramid and its use in daily diet’ – emphasis on increasing fiber and reducing fat in the daily diet. The session lasted for more than 90 minutes (n = 50) Photograph 3 – Appendix 4.</td>
</tr>
<tr>
<td>III (2003-2004) October, 2003</td>
<td>Session on ‘Development of Food Habits’ for parents of pre-school and primary school children, lasting over 60 minutes (n = 300) Photograph 4 – Appendix 4</td>
<td>Class-teachers attended the sessions with parents (n = 12)</td>
</tr>
<tr>
<td>IV (2005-2006) October, 2005</td>
<td>1. Series of sessions for parents on ‘Impact of TV advertising on food consumption patterns in middle childhood’ conducted standard-wise. Each session lasted for over 60 minutes (n=349). Photograph 5 – App.4 2. Session for grandparents on ‘Food Pyramid and its use in daily diet’ and ‘How to handle fussy food habits in children’, lasting over 120 minutes (n=32)</td>
<td>Class-teachers attended the sessions with parents (n = 12)</td>
</tr>
</tbody>
</table>
Interventions for Children:

Intervention 1 (2001-2002): The focus of the interventions and activities in this phase was on:

a) Ensuring adequate food intake by children for lunch (with special reference to dish liked or disliked by children), with emphasis on defining the minimum and maximum quantities of food for lunch as well as evening snack and, minimizing/reducing wastage of food

b) Planning appropriate menus considering children’s likes and dislikes, variations in taste and seasonal variations

c) Teaching the Food Pyramid to all the children from Primary and Secondary levels;

d) Imparting nutrition education to children from VII to IX standards as per the school curriculum in a more meaningful manner. This was done as listed hereunder:
   - For I and II standards: use of Songs, Stories and Puppet show
   - For III and IV standards through Puppet show and Games
   - Secondary School – using the actual Food Pyramid

e) Conducting workshops for Parents and Teachers (of children from Pre-Primary to Secondary school) on ‘Know Your Heart Risk’ by the researcher

f) Anthropometry for children – for all classes

In addition, since there were some new entrants in the school, their parents were requested to fill both the KAP and Food Frequency questionnaires.

Table III-3 delineates the inputs given over the four-year period to the children of primary as well as secondary classes. The topics covered class-wise, the number of sessions per topic and the methodology used for each topic are summarized therein. All sessions in the first year (2001-2002) were conducted by the researcher herself. Weights and heights were taken twice in the year for all children.
<table>
<thead>
<tr>
<th>Year</th>
<th>Standard</th>
<th>Topics focused on and Number of sessions per topic per standard</th>
<th>Methodology/ Tools used</th>
</tr>
</thead>
<tbody>
<tr>
<td>2001-2002</td>
<td>Pre-school</td>
<td>Nutrition messages</td>
<td>1) Songs</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>2) Stories</td>
</tr>
<tr>
<td>2001-2002</td>
<td>I and II</td>
<td>a) Basic functions of food</td>
<td>a) Food colour wheel – Appendix 2a) (page 356)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>b) Introduction of food groups and food items in each group (Number of sessions – 3/ standard)</td>
<td>b) Food guide pyramid – Appendix 2b) (page 357)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>c) Variety of foods in each food group (3 sessions/ standard)</td>
<td>c) Story built around a fairy’s birthday party – paper puppets and photographs – Appendix 2c) (page 358)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>d) Concept of variety and its importance for healthy eating (1/ standard)</td>
<td>d) Game of nutrition – Snakes and Ladders - Appendix 2d) (page 362)</td>
</tr>
<tr>
<td>2001-2002</td>
<td>III and IV</td>
<td>a) Basic functions of food</td>
<td>a) Food pyramid chart</td>
</tr>
<tr>
<td></td>
<td></td>
<td>b) Introduction of food groups and food items in each group</td>
<td>b) Food pyramid chart and pictures of different foods</td>
</tr>
<tr>
<td></td>
<td></td>
<td>c) Variety of foods in each food group</td>
<td>c) Pictures of different foods</td>
</tr>
<tr>
<td></td>
<td></td>
<td>d) Concept of variety and its importance for healthy eating</td>
<td>d) Nutrition game – Snakes and Ladders</td>
</tr>
<tr>
<td></td>
<td></td>
<td>e) Linkage between food groups and food served in school</td>
<td>e) Interactive classroom teaching</td>
</tr>
</tbody>
</table>

(Total number of sessions for all – 3 per standard)
| 2001-2002 | V and VI | a) Introduction to food pyramid, food groups and their nutrient contribution  
| b) Variety of foods in each food group  
| c) Concept of variety and its importance for healthy eating  
| d) Linkage between food groups and food served in school (Total number of sessions – three per standard) | 1) Food pyramid chart and  
| 2) Interactive classroom teaching for all sessions |
| 2001-2002 | VII and VIII | a) Introduction to food pyramid, food groups and their nutrient contribution  
| b) Variety of foods in each food group  
| c) Concept of variety and its importance for healthy eating  
| d) Linkage between food groups and food served in school (Total number of sessions – three per standard) | 1) Food pyramid chart  
| 2) Wrote the ingredients and food groups in a recipe  
| 3) Noted the nutrients supplied from these groups  
| 4) Food groups included in the food served in the school  
| 5) Interactive classroom teaching for all sessions |
| 2001-2002 | IX | a) Introduction to food pyramid, food groups and their nutrient contribution  
| b) Variety of foods in each food group  
| c) Concept of variety and its importance for healthy eating  
| d) Deficiencies of various nutrients  
| e) Linkage between food groups and food served in school (Total number of sessions – four) | 1) Food pyramid chart  
| 2) Wrote the ingredients and food groups in a recipe  
| 3) Noted the nutrients supplied from these groups  
| 4) Food groups included in the food served in the school  
| 5) Interactive classroom teaching for all sessions  
| 6) Nutrition test |

In this phase, the following activities were undertaken:

a) Anthropometry for children continued for all children
b) Nutrition education continued for the primary classes
c) Nutrition Theory for IX and X standards based on the school curriculum, with knowledge tested by the researcher
d) Teaching X standard children to plan “A day’s menu” for themselves, with the menus being evaluated by researcher
e) Training the teachers to conduct “Nutritious Cookery” classes for VIII standard with emphasis on modifying popular’ fast foods’ to create awareness among children that nutritional content of fast foods can be enhanced

Table III - 4 summarizes the topics covered and the methodology/tools used for the various classes. In this year, all sessions were taken by the researcher herself.
<table>
<thead>
<tr>
<th>Year</th>
<th>Standard</th>
<th>Topics focused on</th>
<th>Methodology/ Tools used</th>
</tr>
</thead>
<tbody>
<tr>
<td>2002-</td>
<td>Pre-</td>
<td>Nutrition messages – Foods and their benefits</td>
<td>1) Songs and Stories</td>
</tr>
<tr>
<td>2003</td>
<td>school</td>
<td></td>
<td>2) Coloring food pictures</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>3) Simple cookery – peeling potatoes, shelling peas, grating</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>and making salad etc.</td>
</tr>
<tr>
<td>2002-</td>
<td>I</td>
<td>a) Basic functions of food</td>
<td>1) Food colour wheel</td>
</tr>
<tr>
<td>2003</td>
<td></td>
<td>b) Introduction of food groups and food items in each group</td>
<td>2) Food pyramid chart</td>
</tr>
<tr>
<td></td>
<td></td>
<td>c) Variety of foods in each food group</td>
<td>3) Story built around a fairy’s birthday party – paper puppets</td>
</tr>
<tr>
<td></td>
<td></td>
<td>d) Concept of variety and its importance for healthy eating</td>
<td>4) Game of nutrition – Snakes and Ladders</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(Total number of sessions for all – seven)</td>
<td></td>
</tr>
<tr>
<td>2002-</td>
<td>II</td>
<td>a) Recapitulation of topics covered in I standard</td>
<td>1) Food pyramid chart</td>
</tr>
<tr>
<td></td>
<td></td>
<td>c) Linkage between food groups and food served in school</td>
<td>3) Interactive classroom teaching for all sessions</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(Total number of sessions – three)</td>
<td></td>
</tr>
<tr>
<td>Year</td>
<td>Grade</td>
<td>Topics</td>
<td>Activities</td>
</tr>
<tr>
<td>--------</td>
<td>-------</td>
<td>------------------------------------------------------------------------</td>
<td>--------------------------------------------------------------------------</td>
</tr>
</tbody>
</table>
| 2002-  | III   | a) Recapitulation of topics covered in II standard b) Foods required   | 1) Food pyramid chart  
| 2003   |       | for growth - food choices and their effect on health c) Linkage between | 2) Nutrition game – Snakes and Ladders  
|        |       | food groups and food served in school                                  | 3) Interactive classroom teaching for all sessions  
|        |       | (Total number of sessions – three)                                     | 4) III standard – students prepared fruit salad/ salad during their stay in school |
| 2002-  | IV    | a) Recapitulation of topics covered for III standard                  | 1) Food pyramid chart  
| 2003   |       | b) Foods required for growth                                           | 2) Interactive classroom teaching for all sessions  
|        |       | c) Importance of nutrition for health – deficiencies of nutrients    | 3) Interactive classroom teaching for all sessions  
|        |       | in brief                                                               | 4) Skit by children for c)  
|        |       | (Total number of sessions – three)                                     |                                                          |
| 2002-  | V and VI | a) Recapitulation of topics covered for IV, V standards              | 1) Food pyramid chart  
| 2003   |       | b) Foods required for growth                                           | 2) Interactive classroom teaching  
|        |       | c) Importance of nutrition for health                                 | 3) Children prepared charts for b) and c)  
|        |       | d) Deficiencies of nutrients                                          | 4) Skit by children for c)  
|        |       | (Total number of sessions – four per standard)                        |                                                          |
| 2002-  | VII   | a) Recapitulation of food pyramid and food groups                     | 1) Food pyramid charts (Appendix 5)  
| 2003   |       | b) Reading food labels                                                | 2) Group work of noting down nutrition information from empty wrappers of processed foods  
|        |       | c) Nutrient requirement for growth                                     | 3) Group work for identifying food groups from ingredients used and nutrients supplied  
|        |       | (Total number of sessions – four)                                     |                                                          |
| 2002-2003 | VIII | a) Recapitulation of food pyramid and nutrient for growth  
b) Plan breakfast for self  
c) Identify food groups for b)- comparing nutritive values with ideal breakfast  
d) List snacks of children’s choice with ingredients (home work)  
e) Identify food groups in d) and their nutrient contributions  
f) Reduce fat content and increase fiber content in self breakfast and snacks planned  
(Total number of sessions – four) | 4) Presentation of information printed on various wrappers by group representatives  
1) Food pyramid chart – one for the class, and one each per student (Appendix 5)  
2) Individual work for b) to f)  
3) Cooking of basic recipes and modified snacks  
4) Nutrition test on nutrients supplied by each group and deficiencies of nutrients  
5) Children plotted two readings of their heights and weights |
|---|---|---|
| 2002-2003 | IX and X | a) Recapitulation of food pyramid  
b) Functions of food and deficiencies of nutrients  
c) Foods for growth  
d) Balanced diet for the day – self plan  
e) Reduce fat content in the self plan  
f) Increase fiber content in the self plan  
(Total number of sessions -- two for theory + six for Menu Planning per standard) | 1) Food pyramid chart (Appendix 5)  
2) Individual work to make a list of foods eaten throughout the day per meal, identify the food groups  
3) Nutrient composition of each meal  
4) Nutrition test on balanced diet  
5) Children plotted two readings of their heights and weights |
Curriculum for Modified Cookery Practical (held on Saturdays in November, December, January and February 2001-02 and 2002-03)

The school curriculum included making simple recipes like rice and dal, mungdal khichadi, tadka dal, pohe and upma, toast, coffee etc. The practical included these dishes; as well as simple operations like boiling milk, setting curd, preparing sprouts etc. The demonstrations by the researcher/teachers and practical sessions by the researcher/teachers and students were held each year (Table III -5).

The following is a list of recipes demonstrated / prepared –
1) Plain rice and dal, mungdal khichadi, vegetable pulav
2) Milk cookery – boiling milk, setting curd, paneer and white sauce/ custard
3) Paneer toast and vegetable soup
4) Plain paratha and chapati
5) Methi thepla and stuffed paratha
6) Sandwiches – different fillings
7) Salads, sprouting legumes, fruit salad
8) Vegetable burger and vegetable cutlet
9) Pav bhaji, milk shake
10) Bhel and sprout chat.

The details are given Appendix – 3 – Module 3 (page 367).

After each demonstration, a discussion was held for about 15 minutes for improving the nutritive value of recipe/s in the next practical, by modifying the ingredients or serving suitable accompaniments.
Phase II – Intervention 3 (2003-2004):

a) Teaching Food Pyramid to all classes continued

b) Sessions on “Childhood obesity, junk foods and fast foods, importance of exercise” conducted by students of Home Science College
   - For pre-primary through Songs and Stories, simple cookery experiences like shelling peas, boiling potatoes, making simple salads
   - For I to IV standards through Puppet show – Photographs 6 and 7, Appendix 4 (page 398)
   - For V and VI standards through Drama – Photographs 8 and 9, Appendix 4 (page 398)
   - For VI standard through ‘Reading Food Labels’
   - For VII standard through Food Pyramid and modified cookery
   - For IX and X standards through menu planning

The methodologies and tools used and the topics covered are shown in Table III-5. In this year, some sessions for children studying in classes I to VI were taken by the researcher jointly with the students of a local college (S.N.D.T. College of Home Science). For children in higher classes, all sessions were taken by the researcher.
<table>
<thead>
<tr>
<th>Year</th>
<th>Standard</th>
<th>Topics focused on</th>
<th>Methodology/ Tools used</th>
</tr>
</thead>
<tbody>
<tr>
<td>2003-</td>
<td>Preschool</td>
<td>Nutrition messages – focus on childhood obesity,</td>
<td>1) Songs and Stories</td>
</tr>
<tr>
<td>2004</td>
<td></td>
<td>foods that can make us fat and importance of exercise</td>
<td>2) Simple cookery – peeling potatoes, shelling peas,</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(Total number of sessions – 12 from January to March, one</td>
<td>grating and making salad etc.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>session per week)</td>
<td>3) Vegetable market</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>4) Puppet show on junk foods/ fast foods</td>
</tr>
<tr>
<td>2003-</td>
<td>I and II</td>
<td>a) Basic functions of food</td>
<td>1) Food pyramid chart</td>
</tr>
<tr>
<td>2004</td>
<td></td>
<td>b) Introduction of food groups and food items in each group</td>
<td>2) Activity sheets (Appendix 5)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>c) Thrust on childhood obesity, foods that can make us</td>
<td>3) Interactive classroom teaching on junk foods/ fast foods</td>
</tr>
<tr>
<td></td>
<td></td>
<td>us fat- junk foods/ fast foods ; and importance of exercise</td>
<td>4) Puppet show</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(Total number of sessions – 4 including Puppet show)</td>
<td></td>
</tr>
<tr>
<td>2003-</td>
<td>III and</td>
<td>a) Basic functions of food</td>
<td>1) Food pyramid chart</td>
</tr>
<tr>
<td>2004</td>
<td>IV</td>
<td>b) Introduction of food groups and food items in each group</td>
<td>2) Activity sheets (for III standard) (Appendix 5)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>c) Thrust on childhood obesity, foods that can make us</td>
<td>3) Interactive classroom teaching for c), d) and e)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>us fat- junk foods/ fast foods</td>
<td>4) Skit on `Fast Foods/ Junk Foods’ by children in 2 groups – IV standard</td>
</tr>
<tr>
<td></td>
<td></td>
<td>d) Importance of exercise</td>
<td>5) III standard – students prepared fruit salad/ salad</td>
</tr>
</tbody>
</table>
| 2003-2004 | V and VI | e) Comparison between computer/ sedentary games and active games  
(Total number of sessions – four per standard) | during their stay for night camp in school  
1) Food pyramid chart  
2) Interactive classroom teaching for c), d), e) and f)  
3) Dramatization – childhood obesity, junk foods/ fast foods and lack of exercise |
| 2003-2004 | VII | a) Recapitulation of food pyramid  
b) Thrust on childhood obesity, foods that can make us fat- junk foods/ fast foods and their nutrient contributions  
c) Energy expenditure of various activities  
d) Importance of exercise  
e) Comparison between computer/ sedentary games and active games  
(Total sessions – five per standard including one for dramatization) | 1) Food pyramid chart  
2) Interactive classroom teaching for b), c), d) and e)  
3) Dramatization – childhood obesity, junk foods/ fast foods and lack of exercise  
4) Planning breakfast for self |
| 2003-2004 | VIII | a) Recapitulation of food pyramid – Nutrients and their food sources  
b) Plan breakfast for self  
c) Identify food groups for b) - compare nutritive values with ideal breakfast  
d) List snacks of their choice with ingredients (home work)  
e) Identify food groups in various snacks and their nutrient contributions  
f) Reduce fat content and increase fiber content in snacks  
(Total number of sessions – four) | 1) Food pyramid chart – one for the class, and one each per student  
2) Individual work for b) to f)  
3) Cooking basic recipes and modified snacks  
4) Nutrition test on nutrients supplied by each Group and deficiencies of nutrients |
| 2003-2004 | IX and X (only new-comers) | a) Recapitulation of food pyramid  
b) Nutrients and their food sources  
c) Deficiencies of nutrients  
d) Nutrient requirement for growth  
e) Balanced diet for the day – self plan  
f) Reduce fat content in the self plan  
g) Increase fiber content in the self plan  
(Total number of sessions – eight per standard) | 1) Food pyramid chart  
2) Individual work to make a list of foods eaten throughout the day per meal, identify the food groups  
3) Nutrient composition of each meal  
4) Nutrition test on balanced diet |

In this phase, teachers from the school were involved in providing educational inputs to the children (Table III - 6). The various activities undertaken in this period were:

a) Teachers start teaching Food Pyramid and simple cookery for I to IV Standards,

b) Nutrition-related posters made by IV to VI standard children

c) Modified cookery classes for VIII standard continued

d) Menu planning by IX and X standard children continued

e) For VIII to IX standards talks by eminent cardiologist of Pune, Dr. Jagadish Hiremath on ‘Balance in Life’; and by Sports Specialist Dr. Sachin Tapaswi on ‘Importance of Exercise for growing children’ were organized.

For children in classes VII, VIII and IX the sessions were conducted by the researcher herself, for the younger children sessions were conducted jointly by the researcher and the students of the S.N.D. T. College of Home Science.
<table>
<thead>
<tr>
<th>Year</th>
<th>Standard</th>
<th>Topics focused on</th>
<th>Methodology/ Tools used</th>
</tr>
</thead>
</table>
| 2004- | Pre-      | Nutrition messages – thrust on childhood obesity, foods that can make us fat – junk foods and fast foods; and fun through exercises (Total number of sessions – Girls present from January to March, 2004 – information imparted one session a week) | 1) Songs and Stories  
2) Simple cookery – peeling potatoes, shelling peas, grating and making salad etc.  
3) Vegetable market  
4) Puppet shows on junk foods/ fast foods and fun through exercise |
| 2005  | school   |                                                                                                                                                                                                                 |                                                                                                                                                                                                                       |
| 2004- | I and II | a) Wrap up sessions on basic functions of food  
b) Importance of breakfast, eating fruits and vegetables with skin  
c) Thrust on childhood obesity, foods that can make us fat- junk foods/ fast foods; and fun through exercise (Total number of sessions – two per standard + one for puppet show) | 1) Food pyramid chart  
2) Interactive classroom teaching with Puppets  
3) Puppet show |
| 2005  |          |                                                                                                                                                                                                                 |                                                                                                                                                                                                                       |
| 2004- | III and  | a) Wrap up sessions on basic functions of food  
b) Importance of breakfast, eating fruits and vegetables with skin  
c) Thrust on childhood obesity, foods that can make us fat- junk foods/ fast foods; and fun through exercise (Total number of sessions – two per standard + one for puppet show) | 1) Food pyramid chart  
2) Interactive classroom teaching for b) and c)  
3) Puppet show  
4) III standard – students prepared fruit salad/ salad during their stay for night camp in school |
| 2005  | IV       |                                                                                                                                                                                                                 |                                                                                                                                                                                                                       |
| 2004- | V, VI and| a) Wrap up sessions on basic functions of food  
b) Importance of breakfast, eating fruits and vegetables with skin                                                                                                                                                  | 1) Food pyramid chart  
2) Interactive classroom teaching for b) and c)                                                                                                                                |
<p>| 2005  | VII      |                                                                                                                                                                                                                 |                                                                                                                                                                                                                       |</p>
<table>
<thead>
<tr>
<th>Year</th>
<th>Grade</th>
<th>Activities</th>
<th>Additional Information</th>
</tr>
</thead>
</table>
| 2004-2005 | VIII  | a) Recapitulation of food pyramid and food groups  
b) Plan breakfast for self  
c) Identify food groups for b) - compare nutritive values with ideal breakfast  
d) List snacks of their choice with ingredients (home work)  
e) Identify food groups in d) and their nutrient contributions  
f) Reduce fat content and increase fiber content in d)  
g) Balance in life and Exercises for pre-adolescent and adolescent students (Total sessions – four + two lectures by Physicians) | 1) Food pyramid chart – one for the class, and one each per student  
2) Individual work for b) to f)  
3) Plan modified snacks  
4) Plan and cook modified pav-bhaji and milk shake – group work for the entire class  
5) Nutrition test on nutrients supplied by each group and deficiencies of nutrients  
g) Lectures with audio-visual aids by physicians |
| 2004-2005 | IX and X (for new students) | a) Balanced diet for the day – self plan  
b) Reduce fat content in the self plan  
c) Increase fiber content in the self plan  
d) Balance in life and Exercises for pre-adolescent and adolescent students  
(Total number of sessions – four per standard + two lectures by Physicians) | 1) Food pyramid chart  
2) Individual work to make a list of foods eaten throughout the day per meal, identify the food groups  
3) Nutrient composition of each meal  
4) Nutrition test on balanced diet  
d) Lectures with audio-visual aids by physicians |
Phase II – Intervention 5 (2005-2006):

This consisted of:

a) Workshop for parents and teachers of Pre-primary and Primary school on ‘Know Your Heart Risk’

b) Presentation to parents of Pre-primary and Primary school children on ‘Food Advertisements on TV and their impact on children’

c) Inputs to the children continued as shown in Table III -7. Sessions were taken by school teachers, students from S.N.D.T. College of Home Science and the researcher

Table III – 7: Ongoing Interventions for Children

<table>
<thead>
<tr>
<th>Year</th>
<th>Standard</th>
<th>Topics focused on</th>
<th>Methodology/ Tools used</th>
</tr>
</thead>
</table>
| 2005-2006 | Pre-school | Nutrition messages – thrust on childhood obesity, foods that can make us fat – junk foods and fast foods; importance of exercise | 1) Songs and Stories  
2) Simple cookery – peeling potatoes, shelling peas, grating and making salad etc.  
3) Vegetable market |
| 2005-2006 | I to V    | a) Sessions for recapitulation of basic functions of food  
b) Linkage between various body systems and nutrition | 1) Food pyramid chart  
2) Interactive classroom teaching  
3) Individual projects linking various body systems and nutrition – Charts, presentations by children (Teachers and Researcher)  
4) III standard – students prepared fruit salad/ salad during their stay for night camp in school |
<table>
<thead>
<tr>
<th>Year</th>
<th>Grade</th>
<th>Activities</th>
<th>Additional Activities</th>
</tr>
</thead>
<tbody>
<tr>
<td>2005-2006</td>
<td>VIII</td>
<td>a) Modified bulk cookery</td>
<td>1) Students prepared modified pav bhaji and cold coffee as practical experience for their Scouts and Guide work</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2005-2006</td>
<td>X (new-comers)</td>
<td>a) Understanding food groups and their nutrient contribution</td>
<td>1) Food pyramid chart</td>
</tr>
<tr>
<td></td>
<td></td>
<td>b) Balanced diet for the day – self plan</td>
<td>2) Individual work to make a list of foods eaten throughout the day per meal, identify the food groups</td>
</tr>
<tr>
<td></td>
<td></td>
<td>c) Reduce fat content in the self plan</td>
<td>3) Nutrient composition of each meal</td>
</tr>
<tr>
<td></td>
<td></td>
<td>d) Increase fiber content in the self plan</td>
<td>4) Nutrition test on balanced diet</td>
</tr>
<tr>
<td>2005-2006</td>
<td>Preschool to X</td>
<td>Anthropometry</td>
<td>All by Researcher</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2005-2006</td>
<td>VI to IX</td>
<td>Nutrition for health</td>
<td>Height and Weight monitoring (by Sports teachers)</td>
</tr>
</tbody>
</table>
**Phase II – Nutrition Education Intervention -6**

The modules used for various topics and classes are summarized herein:

**Module 1 - Menu planning for IX and X standard students**

This module was conducted for four to six sessions of 60 to 90 minutes each, two times a week for each standard. In the first year of commencement, both IX and X standards were included and later only the IX standard was included (Table III - 8). Details are given in Appendix – 3 - Module 1 (page 363).

**Table III – 8: Sessions for Menu Planning and Topics Covered**

Session One – No grades were given for this session

<table>
<thead>
<tr>
<th>a) To introduce food pyramid</th>
<th>- Displayed the food pyramid chart. Distributed a handout on food pyramid diagram and details of the contents along with the nutrient contribution of each food group.</th>
</tr>
</thead>
<tbody>
<tr>
<td>------------------------------</td>
<td>- Introduced food pyramid, talk about foods in each food group.</td>
</tr>
</tbody>
</table>

Session Two - No grades were given for this session

<table>
<thead>
<tr>
<th>a) To recapitulate food pyramid</th>
<th>Food groups in the pyramid</th>
</tr>
</thead>
<tbody>
<tr>
<td>b) To list ingredients in simple foods</td>
<td>For example Chapatti – wheat flour, oil, water, salt to taste</td>
</tr>
<tr>
<td></td>
<td>The researcher talked about combinations of food groups in various dishes. The children were asked to write down dishes with ingredients, their corresponding food groups and nutrients.</td>
</tr>
</tbody>
</table>

For sessions three to six, children were asked to plan each meal after which education inputs were given. The plans were then reviewed by the children and improvements identified under the guidance of the researcher.
Session Three and Four - Children were graded for these sessions

<table>
<thead>
<tr>
<th>a) Balanced breakfast</th>
<th>Researcher explained the components of an ideal breakfast – cereal, protein and vitamin C. Children checked the food groups included in their menus planned earlier. Researcher taught the children to modify their menus based on the gaps observed.</th>
</tr>
</thead>
<tbody>
<tr>
<td>b) Balanced Lunch</td>
<td>Researcher explained the components of an ideal lunch – all food groups from the pyramid with moderate use of fats and sugars, and including whole grain, vegetables and fruits with skin. Children checked the food groups included in their menus planned earlier. Researcher taught the children to modify their menus based on the gaps observed.</td>
</tr>
<tr>
<td>c) Plan evening snack and dinner dishes of their choice</td>
<td>Home work – Children planned the same, and got checked by parents at home</td>
</tr>
</tbody>
</table>

Session Five and Six - Children were graded for these sessions

<table>
<thead>
<tr>
<th>a) Ideal evening snacks</th>
<th>Researcher explained the role of evening snack as a bridge to fill the calorie gap, and should include cereals and protein with moderate use of fat and sugar. Children checked the food groups included in their menus planned earlier. Researcher taught the children to modify their menus based on the gaps observed.</th>
</tr>
</thead>
<tbody>
<tr>
<td>b) Balanced dinner</td>
<td>Researcher explained how to achieve variety in dinners, while including all food groups from food pyramid. Children checked the food groups included in their menus planned earlier. Researcher taught the children to modify their menus based on the gaps observed.</td>
</tr>
<tr>
<td>c) Summary of learning</td>
<td>Researcher summarized the learning from all these sessions along with the children. Children asked to submit the final menus for a day. Children graded for overall menu planning.</td>
</tr>
</tbody>
</table>
Grading of the plans was done. The score values given to each item are given in Table III - 9.

**Table III - 9: Points Allocated for Various Food Items**

<table>
<thead>
<tr>
<th>Meal</th>
<th>Key details (Points allocated)</th>
</tr>
</thead>
</table>
| **Breakfast**| Cereal, Protein and vitamin C included - 5  
Cereal and Protein included - 4  
Cereal + vitamin C/ fruit - 3  
Protein + vitamin C/ fruit - 3  
Only Cereal included - 2  
Only Protein included - 2  
Fiber consciously added - (+1)  
High Fat / high Sugar - (-1) |
| **Lunch**    | All food groups included -5  
Food groups other than Vegetable/ fruit - 3  
Food groups other than Protein - 3  
Fiber consciously included - (+1)  
High Fat/ high Sugar - (-1)  
Only Potato vegetable - (-1) |
| **Evening snack** | Both Cereal/ Carbohydrate and Protein included - 5  
Only Cereal/ Carbohydrate - 4  
Only Protein included - 4  
Fiber consciously added - (+1)  
Sugar and Fats in excess - (-1) |
| **Dinner**   | All food groups included -5  
Food groups other than Vegetable/ fruit - 3  
Food groups other than Protein - 3  
Fiber consciously included - (+1)  
High Fat/ high Sugar - (-1)  
Only Potato vegetable - (-1) |

Maximum scores were: 6 for each of Breakfast, Lunch, Evening Snack and Dinner; 0 or ½ or 1 additional for Overall Menu and 25 for Total.

Question paper was given for Nutrition test after theory classes (8/10/2001) – Maximum marks = 15. The details are in Appendix 3 – Module 2 (page 366).


Evolution of Modified Cookery (1 term of 2001-2002)

1. Children desired more spicy and oily food, if served during lunch as well as for evening snacks.
2. Children preferred snacks like pav-bhaji, burger, sago khichadi more frequently over the cereal preparations like pohe, upma etc.

These observations triggered the development of Modified Cookery Practical which was designed for VIII standard, since it was part of their curriculum. Prior to these practical experiences, four interactive sessions were held to explain to the children that it is possible to reduce fats and sugars, and increase fiber, while taking care of the taste. These sessions and practicals were held from October to December, in both 2001-02 and 2002-03.

The details of these sessions are given in Appendix – 3 – Module 3 (page 367).


Sessions were conducted from January to February 2004, for approximately 6 weeks.
Topics focused on: Food Pyramid; Junk Foods and Fast Foods + Lack of Exercise, as a main cause for childhood obesity.

The students were encouraged to ‘ask questions’, and in many cases ‘provide examples and part of the answers’ as well.
Standard I and II – Interactive Sessions (2003-04)

Three sessions each were conducted class-wise by two S. N. D. T. students, specializing in Early Childhood Education, per class. The messages given are summarized below-

Session One:
- We must eat cereals during all the meals of the day
- Vegetables and fruits protect us from many diseases
- We must eat lots of salads, vegetables and fruits everyday
- Everyday we must drink milk and eat other protein foods
- Fats and sugars give us ‘too much energy’, and very little minerals and vitamins
- Junk foods make us fat but not strong
- Junk foods, though tasty, should be eaten only for special occasions, birthday parties and picnics

Sessions Two and Three:
- Active games help us feel more energetic and make more friends. We must play active games
- Sedentary games can make us fat

Standard III and IV – Interactive Sessions (2003-04)

Four sessions each were conducted class-wise by two S. N. D. T. students, specializing in early childhood education, per class. The messages given are summarized below-

Sessions 1 and 2:
- We must eat cereals during all the meals of the day
- We must eat cereals for breakfast
- Vegetables and fruits protect us from various diseases
- We must eat lots of salads, vegetables and fruits everyday
- Everyday we must drink milk and eat various protein foods
- We must eat animal proteins in limited quantities
- Fats and sugars give us ‘too much energy’, and very little minerals and vitamins
- Fats and Sugars make our body fat, but not strong
- Junk foods make us fat but not strong
- These foods should be eaten only for special occasions, picnics and birthday parties
- Obesity puts additional burden on our heart and bones
- Less calcium deposition in bones of obese children
- Modified fast foods can be eaten more frequently

Sessions Three and Four:
- Active games help us feel more energetic and make more friends. We must play active games
- Active games reduce obesity
- Sedentary games can make us obese


Four sessions each were conducted class-wise by two S. N. D. T. students specializing in early childhood education, per class. The messages given are summarized below-

Sessions One and Two:
- We must eat cereals during all the meals of the day
- We must eat wholegrain cereals wherever possible
- We must eat cereals for breakfast
- Vegetables and fruits protect us from various diseases and atmospheric pollution
- We must eat lots of salads, vegetables and fruits everyday in all meals
- Everyday we must drink milk and eat various protein foods
- We must eat foods of animal origin, such as meat, paneer, cheese in limited quantities
- We can use skimmed milk and paneer for other dishes also
- Fats and sugars give us ‘too much energy’, and very little minerals and vitamins
- Fats and Sugars make our body fat, but not strong
- ‘Home-made modified fast foods’ – tasty and nutritious - can be eaten more frequently
- Junk foods make us obese but not strong, as they supply only calories from fats and
sugars, and salt. They do not supply vitamins and minerals.
- Hence, junk foods should be eaten only for birthday parties, picnics etc.
- Less calcium deposition in bones of obese children

Sessions Three and Four:
- Active games help us feel more energetic and make more friends. We must play active games so that we do not become obese.
- Sedentary games can make us obese, and our friends tease us more.

The details of these sessions have been shown in Appendix 3 – Module 4a on page 376.


Reading and Interpreting Food Labels

Two sessions were conducted by the Researcher in January, 2004 for 27 students from VII standard.
The aim was to teach children to read the food labels of various processed foods available in the market.
Packets of 16 products were collected and distributed three wrappers/ packets to teams of three students each. They were asked to note down the ingredients as well as nutritive information on the wrapper/ label of each item. Children were asked to write down the food groups against each ingredient as well as the nutrients supplied by each food, for all the three foods.
The students were encouraged to ‘ask questions’, and in many cases ‘provide examples and part of the answers’ as well.
The exercise brought out the following –
1. The information published on the wrapper/ label is not clear, and can be misleading.
2. The price for the nutrients supplied cannot be justified in many cases.
3. Use of tricky words can be confusing, e.g. comparison of one cup of milk with a slice of cheese.
4. For energy dense foods – contents of the packet and information given do not match.
5. Many students were shocked to realize that the fat content of popular junk food brands was very high.

6. It is important for students to read the labels carefully to understand the food value and the price paid.

The details are given in Appendix 3 – Module 4b (page 387)


Wrap-up sessions were conducted for standards I to VI to recapitulate the information given in the previous year, with the focus on ‘childhood obesity, junk food/ fast foods and lack of exercise’. It was noticed earlier that some children skipped breakfast in the mornings. Hence, the thrust was on ‘the importance of breakfast’. Also the sports teachers wanted to stress the importance of exercises. Hence puppet show and dramatization were designed to highlight ‘exercise through fun, harmful effects of junk foods/ fast foods’.

**Comments made by children after ‘Puppet Show’ (2003-04)**

- I will not eat junk food regularly, but eat only ‘once in a while’
- I will stop drinking ‘soft drinks’
- They wanted to formulate exercise sequences for various tunes
- Wanted to learn the technique of a puppet show, since they wanted to present on some topic in their own class

**Interactive sessions for ‘Importance of Breakfast’ for Standards I to V were conducted separately in their classrooms (2005-06)**

A) Standards I and II (Using puppets) –

- Meaning of the word ‘Breakfast’
- Did they eat breakfast everyday – if yes – why; and if no – why
- What do they normally eat for breakfast
• Stress on eating Cereal (like cornflakes, bread, paratha/chapatti, idli etc) along with milk and fruit
• Eating breakfast improves attention in the class

B) Standard III, IV and V-
• Did they eat breakfast everyday – if yes – why; and if no – why
• What do they normally eat for breakfast
• Why eating a Cereal is important
• Breakfast is an important meal of the day – we must have cereals like cornflakes, bread, paratha/chapatti, idli etc), protein foods like milk or egg; and fruit
• Eating breakfast improves attention in the class

The details are given in Appendix 3 – Module 4 c (page 390)
In addition to all the inputs described previously, doctors were invited to speak to the students.

Module 5 – Talks by Health Professionals to Standard VIII to X Students (2003-04 and 2004-05)

Dr. Jagdish Hiremath (Cardiologist) 2004-2005 – The topics covered by him were

• Balance in life: Important components of life
  – Interaction with parents/ in the family
  – Interaction with peers
  – Eating balanced food
  – Participation in outdoor sports/ exercises
  – Studies
• Interaction with parents and peers, together with participation in outdoor sports/exercises is important for Mental Health also
• Eating balanced food and outdoor sports/exercises are essential for physical well-being
• Eating balanced food is essential for ‘improving general health and concentration’ and hence connected with ‘studies’
• Eating food together is an important component of ‘Interaction in the family’

Dr. Sachin Tapaswi (Orthopedic Surgeon – Specialist in Sports Medicine) 2004-05 spoke on:
• Exercises suitable for school children and benefits – all age groups
• Pre-primary children (up to five years) – active play like running, jumping etc for 20 minutes in two sets of 10 minutes each, per day
• For children 6 – 12 years of age – active play like running, jumping, other active sports for 30 minutes at a stretch, per day
• For children above 12 years of age – active sports for at least 30 minutes per day; strength building exercises like push-ups, squats etc are advisable; gymnasium exercises like weight-training from 14 years of age is recommended
• Active sports and regular exercises strengthen the musculo-skeletal system, cardio-vascular system and improve the lung capacity
• Group sports also improve the social skills

Module 6 – Workshops with Parents (2000-2001 onwards)

Table III – 10: A) Parents’ Workshops – General Background Information after launching the study (2001-2002)

<table>
<thead>
<tr>
<th>Date</th>
<th>Standard and No. of parents attended</th>
<th>Topics focused on</th>
</tr>
</thead>
<tbody>
<tr>
<td>12/6/2001 to 14/6/2001</td>
<td>I Std; II to X standard; Pre-primary school; Parents of newly admitted children</td>
<td>Kind of food served at school and timing of food service provided. Parents requested to pay attention to their children ‘overeating’ foods liked and under-eating foods not liked. Parents requested not to over-emphasize the taste of food, as against the nutritive value, at their homes. The aim was to help children start eating nutritionally balanced food served in the school.</td>
</tr>
</tbody>
</table>
B) Parents’ Workshops — ‘Know Your Heart Risk’ (2001-2002)

A series of workshops on ‘Know Your Heart Risk’ were conducted class-wise in June/July, 2001 for the parents of children from Pre-primary to X standard. Researcher designed a special questionnaire covering the food habits, exercise habits and lifestyle of parents. The questionnaire had a nomogram ‘Predict Your heart Risk’. This workshop was used to sensitize the parents about importance of nutrition for healthy living.

The questionnaire was divided into four parts. The first part included general information, height and weight, waist and hip measurements of parents. BMI and waist/hip ratio were calculated by the parents themselves. This part also included nomogram-height and weight, which was explained to the parents after the fourth part. The nomogram is used to predict the probability of illness/death due to cardio-vascular diseases.

The second part included information various illnesses and exercise pattern of the parents. The third part sought detailed information on their eating patterns and food habits. The fourth part related to handling of various emotions and moods (Appendix 5).

The workshops ended by using the nomogram to predict the heart risk of individual parents. The details of questionnaire as well as the workshops are given in Appendix 3 – Module 6A (page 392). The parents took active interest in these participative workshops.

C) Sessions for parents on ‘Food Pyramid and Its Use in Daily Diet’ (2003-2004)

These sessions were conducted class-wise, to help parents select foods to achieve balance in their daily diets. A booklet ‘Food Pyramid and Food Groups’ developed by the researcher was displayed on the board, as well as distributed to all the parents. Food pyramid was briefly explained to them with emphasis on nutrients supplied by each food group. The examples and their respective nutritive values were displayed in the pyramid. Increasing fibre and reducing fat in the daily diet were highlighted. The researcher explained briefly on achieving variety in the daily meals using different food groups.
The booklet and salient features of the explanations are given in Appendix 3-Module 6B (page 394). Food pyramid is shown in Appendix 5.

D) Sessions were held for parents on ‘Impact of Television Advertisement on Food Consumption Pattern in Middle Childhood’ (2006-2007: June, 2006)

The number of parents of children from various standards is presented in Table III – 11.

Table III – 11: Number of Parents Attending Sessions

<table>
<thead>
<tr>
<th>Standard</th>
<th>No. of parents present</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-primary</td>
<td>100</td>
</tr>
<tr>
<td>I</td>
<td>60</td>
</tr>
<tr>
<td>II and III</td>
<td>98</td>
</tr>
<tr>
<td>IV and V</td>
<td>102</td>
</tr>
<tr>
<td>VI and VII</td>
<td>85</td>
</tr>
</tbody>
</table>

Points explained included:

- TV advertisements have high impact on children.
- Children’s ability to comprehend advertisements is influenced by their parents. Children are less susceptible to be misled/ misinformed where parents explain the purpose of advertisement to them.
- Food advertisements affect the purchasing pattern as well as living style of children. Children are attracted to the gifts offered along with the ‘junk foods’. They get habituated to the sedentary games and energy dense ‘junk foods’.
- Parents should involve the children in simple cooking activities at home.
- Based on a UNICEF report, Americans are raising a generation of fat children, and TV is one of the largest contributing factors. A similar scenario is now emerging in India.
Module 7 - Nutrition Education for Teachers – This consisted of:

One-day workshop for teachers on ‘Food Pyramid and Its Use in Planning a Balanced Diet’ (2001-2002)

Food pyramid was briefly explained in June, 2001 to 34 teachers with emphasis on nutrients supplied by each food group. The examples and their respective nutritive values were displayed in the pyramid. Increasing fibre and reducing fat in the planning of daily diet were highlighted (Appendix 5).

Tips were given for increasing fibre and reducing fat in the daily balanced meal

- Include all food groups in the daily diet
- Understand the shape of food pyramid to regulate the respective groups;
- Increase fibre by –
  a) Including whole grain cereals – do not sieve the wheat flour and eat whole wheat bread in stead of white bread;
  b) Including vegetables for all meals, without peeling wherever possible;
  c) Eating plenty of salads;
  d) Eating fruits with skin, wherever possible;
  e) Preferring whole fruit over fruit juice;
- Reduce fat by –
  a) Treating foods in protein group as emphasized earlier;
  b) Using steaming and roasting over frying;
  c) Reading the food labels on processed foods for invisible fats, prior to buying;
  d) Avoiding ‘junk foods’ as they supply fats (many a times saturated fats), sugar and salt, and are harmful to you and your children;

Details are given in Appendix – 3 – Module 7 (page 396)

An exercise was given to Teachers for planning a balanced diet

- Breakfast – Include Cereal, Protein and vitamin C source
- Lunch – Include all food groups, giving importance to ‘high fibre’ foods
• Evening snack – Include Calories and proteins, avoid ‘fatty’ and ‘junk foods’
• Dinner – Include all food groups, giving importance to ‘high fibre’ foods
• Teachers were asked to write down foods from ‘Food Pyramid’ as per the guidelines given above
• Researcher prepared ‘Model Menu’ on the board for each of the 4 meals
• Teachers were asked to compare their menus with the ‘model menus’ and make the necessary changes in their own menus
• Teachers sought clarifications from the researcher during the sessions on various aspects

Teachers’ Workshops – ‘Know Your Heart Risk’ (2001-2002)

Table III – 12: Summary of Workshop for Teachers

<table>
<thead>
<tr>
<th>Date</th>
<th>No. of Teachers attended</th>
<th>Summary</th>
</tr>
</thead>
<tbody>
<tr>
<td>7/6/2001</td>
<td>Teachers from Pre-primary, Primary and Secondary school (n = 50)</td>
<td>Teachers took active part in the workshop, when taken through the questionnaire step by step, and encouraged to seek clarifications on their doubts. No teacher was nearing ‘high risk’ zone of CVD, two teachers were in ‘moderate risk’ zone, and three were with ‘low risk’.</td>
</tr>
</tbody>
</table>

Appendix 5 gives the form for the same.
Phase III: This consisted of evaluation of impact on school children as summarized in Table III – 13.

Table III – 13: Summary of Evaluation of Impact on School Children

<table>
<thead>
<tr>
<th>Year</th>
<th>Standard</th>
<th>Topics focused on</th>
<th>Methodology/ Tools used</th>
</tr>
</thead>
<tbody>
<tr>
<td>March, 2005</td>
<td>VI to X</td>
<td>Post test</td>
<td>Self appraisal –II questionnaire</td>
</tr>
<tr>
<td>2005-2006</td>
<td></td>
<td>Analysis and</td>
<td>Analysis and Interpretation of results</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Results</td>
<td></td>
</tr>
</tbody>
</table>

The post-test was given to students in standards VI to X, covering 196 children. It was conducted in March, 2005. The post-test consisted of a self appraisal form [Appendix 1 (d) – page 362]. This form was different from the one used in the pres-test and the topics included were:

- Foods and functions,
- Frequency of eating breakfast
- Foods preferred and frequency of consumption
- Exercise patterns
- Eating response to stress
- Planning a lunch thali and
- Making a food pyramid.

Analysis of Data

For all statistical analysis SPSS version 11.0 was used.

1) Self Appraisal Questionnaire:
Responses were analyzed and categorized as “Appropriate/ Inappropriate” or “Desirable/ Undesirable” whichever was applicable.

Percentages were calculated for both the pre-test and the post-test. Chi-square test was applied to determine whether children’s responses were influenced by

(a) Mothers’ education and (b) mothers’ occupation.
In addition, for the post-test, the influence of number of years the child had participated in the programme on his/her responses was examined. Further in the post-test, scores were then classified into four categories:

- High good scores,
- Low good scores,
- Low bad scores,
- High bad scores

The categorization varied for each question.

Analysis of the scores was done to compare years of input vis-à-vis the standard wherein children VI to VIII standards were compared IX and X standard children. Comparisons for years of input were maximum two years and three to four years. Odds ratio was calculated for selected responses to selected questions in the post test.

2) KAP and FFQ for parents- descriptive statistics was used. Results were expressed as percentages.

3) Anthropometry - Body mass index was calculated for the baseline and at the end of the study for children. The BMI values were then classified into percentiles based on the CDC classification (2000).

Comparisons were made between the baseline and at the end of the study in terms of percentages in the different percentile categories. Further children were classified vis-à-vis years of input in order to determine whether years of input influenced children’s body mass index. However, this was not analyzed statistically.