Impact Of A Diet And Nutrition Related Education Package On The Awareness And Practices Of School Children Of Chandigarh

S Puri, V Bhatia, H Swami, S Rai, C Mangat

Citation

Abstract

INTRODUCTION
Adolescence, is a period of rapid growth and personal development. The growth and development of adolescents depends to a large extent on their nutrition. The complex myriad of physiological as well as psychological changes, accompanied by rapid growth and increase in physical activity, create special nutritional needs that are higher during adolescence than at any other time in life. Failure to consume adequate diet at this time can potentially retard physical growth, intellectual capacity and delay sexual maturation.

Nutritional status of adolescents is highly influenced by varied eating patterns. The eating pattern of adolescents first increasingly gained attention in western countries in recent years claiming that they have a poor diet. Particular areas of concern have included intake of more dietary fats in comparison to fruits and vegetables. Owing to globalization and urbanization in developing countries, adolescent-eating behaviour is now here also coming under the spotlight.

Both undernourishment and overnourishment in young people are increasing problems in both developing and developed countries. Snacking is a well-established eating pattern amongst adolescents; especially those in the higher socio-economic strata. Teenagers are typically fond of eating 'junk' food, not only for its taste, but because of peer group habits. Although, snacks can be a source of needed nutrients and calories, but it can lead to overweight too. At the other end of spectrum are teens who are undernourished due to eating disorders. Many adolescents feel pressurized to be ideally thin like models in movies or magazines. Some girls embark on their first diet even before leaving elementary school.

Lot of studies in adolescents pertaining to fast food consumption and their various correlates or association with home, school environment have been conducted in developed countries but in developing countries this field is not studied to great extent. Moreover out of these only few account to interventional studies. Hence present interventional study in adolescents is an endeavour to find the inclination towards junk food consumption and the effect of health education. The objectives of present study were: -

1. To ascertain the knowledge and practices of school going adolescents regarding diet and nutrition.
2. To determine the impact of a training package on the subjects regarding diet and nutrition.
3. To ascertain the knowledge and practices of school going adolescents regarding diet and nutrition.

METHODOLOGY
The Union Territory of Chandigarh with a population of one million has literacy rate of 81%.

STUDY AREA
Chandigarh has 104 school in government and 81 in the private sector. The study population comprised of all the government and private senior secondary schools in the urban and rural areas.

BENEFICIARIES OF THE STUDY
Every effort was made to reach all the schools. In the present study, we covered 65 government (13 rural, 52 urban) schools and 31 private schools. In the pilot study in 2003, 4 government schools (2 urban, 2 rural) and 2 private schools were included in the study. Therefore, we reached and educated 102 schools (6 in pilot and 96 in present study). 641
Impact Of A Diet And Nutrition Related Education Package On The Awareness And Practices Of School Children Of Chandigarh

boys and girls from class IX or class XI were enrolled in the pilot study and 904 in the present study in the pre-intervention phase. Overall 1841 adolescents were imparted the health education and another 14086 covered through peer educators. Thus, 32500 adolescents were reached and benefited from the programme. (Flow Chart)

PRE-INTERVENTION PHASE

First the list of all government/government recognized private schools was obtained. The high and senior secondary schools were selected for the study. The students from class IX or class XII of these schools were included in the study.

The information from 904 students was collected on pre-designed, pre-tested format in the preintervention phase. Class teachers were also involved in the programme as the health educators and healthmessengers. The students were interviewed regarding their dietary intake and eating habits. The total calorie intake was measured by 24 hours recall method. The adolescents were also assessed for their knowledge about balanced diet and eating patterns. Anaemia was assessed by clinical examination.

INTERVENTION PACKAGE

A team comprising of doctors, medical social workers and supporting staff were given training about the intervention in the Department of Community Medicine, Govt. Medical College, Chandigarh, prior to commencement of the study.

The information obtained in the preintervention phase was utilized for preparing a booklet entitled “Right diet for adolescents – some basic facts” wherein various doubts and commonly asked questions were answered. Copies of the booklet were given free of cost to principals, concerned teachers, students and to the library of the school. The nutritive values of different food items were provided to them based on the standard guidelines and recommendations (recommended daily allowance) from the National Institute of Nutrition, Hyderabad and ICMR.

The students were also given talks by the doctors as well as trained workers about the balanced diet, importance of balanced diet especially for adolescent age group, nutritive value of different food items including fast food items and the average caloric requirement at their age. In addition, they were also told about the importance of having regular healthy meals, harms of skipping meals, fasting, over indulgence in snacks / fast food items. They were also given information about some adolescent health problems like obesity, malnutrition, anaemia etc. Due consideration was taken during the lectures/talks to encourage them to consume locally available nutritious foods.

The project team also tried to allay the fears regarding various prohibited foods and food fads. The students were provided scientific justification about the nutritive values of various prohibited/restricted food items in their community which was based on diet tables available from NIN, Hyderabad and ICMR. A frank and free question - answer session helped in clearing various myths and misconceptions about nutrition.

POST-INTERVENTION PHASE

After imparting health education, training and intervention, the schools were revisited one month later. Nearly 1/3 of the schools were covered after selecting them randomly in proportion of the rural, urban and private schools.

Information on the format was collected again from 344 adolescents. Comparison with the pre-intervention was made to assess the impact of intervention.

ETHICAL CONSIDERATIONS

The school principals and the class teachers of respective classes in the study group were made aware regarding the project and written permission was taken for conducting the project in their schools. The investigators took informed consent from the participants about the objectives, purpose and methodology of the project. The information was collected from them on the pre-designed, pre-tested questionnaire.

STATISTICAL ANALYSIS

The data was collected, compiled and analysed using SPSS package and epi info version 6.

RESULTS

GENERAL FEATURES

The study covered 17.2% adolescents, from rural, 56.9% from urban and 26% from private schools of Chandigarh. 461 (51%) boys and 443 (49%) girls were covered. The age wise distribution was 13 years (13.2%), 14 years (25.9%) and 15 years (58.9%). A high illiteracy among mothers in rural (43.2%) and in urban (22.1%) was recorded. None of rural mother was graduate in comparison to 37.4% in private schools.

Similarly, Illiteracy rate among Rural and Urban fathers of Adolescents was 14.8% and 8.4%, respectively. 99.2%
fathers in private schools were literate. Nearly 76.5% of students belonged to nuclear families.

**DIETARY / EATING PRACTICES**

In rural schools, 56.7% of students were vegetarian in comparison to 70.8% in urban and 72.3% in private schools. Overall two third of them were vegetarians. A large number of rural 83.2%, 63.3% urban and 53.2% private students were not bringing tiffins in the schools. Only 12.8% of rural and 24.7% of urban children brought chapati/parantha(stuffed chapati) along with vegetables in the tiffins in comparison to 53.7% private children. On the days of interview, about 15.9% of students had not consumed anything in the morning before coming to the schools which came down to 2.7% after the intervention.

As a result of campaign, number of students not eating in schools came down to 21.8% from 30.2%. More students started bringing tiffins from 35.9% to 52.5%. Lesser number started visiting canteens, from 23.7% to 16.5%.

Most common food item consumed by adolescents in canteens were hotdog (42.9%), cold drink (11.6%), samosas (37.3%) and patties (16.3%) Nearly one fifth of adolescent students liked to eat from the vendor outside the school.11.6% of adolescents did not take lunch at home after coming back from school which came down to only 2.9% after health education. Half of adolescents usually visit restaurants / eating joints after school hours. Among rural, urban and private adolescents such visits were 29.7%, 47.7% and 69%, respectively.

58.8% of the adolescents preferred fast food items over regular meals. But as a result of intervention, the preference declined to 31.2%. The impact was good in rural and private school students. Among the junk food items, samosa (42.4%), tikki/chat (39.7%), noodles (25.4%), burger (24.5%) and pizza (23.3%) were preferred most by the adolescents. After explaining the consequences and problems of consuming them in excess, a decline in the preference for these items was observed. About 65% adolescents understood that overeating of Junk food can be hazardous for the health which can cause heart diseases (3%), indigestion (22%), obesity (25%) etc.

**KNOWLEDGE ABOUT NUTRIENTS AND DIET**

Over half the adolescents were consuming less than 1500 kcal/per day in the pre intervention phase which came down to 31.3% in the post intervention. The knowledge regarding the right amount of calories required by the adolescents was hardly known to them but after intervention 88.7% could mention correctly. Health Education resulted in increase in awareness about balanced diet from 42.4% to 82.2%. Awareness about poor diet as cause of Anaemia increased from 29.8% to 58.1%. Only 7.6% were aware of normal Hb and after intervention it increased to 77.6%. The intervention increased the knowledge about causes of malnutrition from 23.5% to 88.1%. Initially 30% of adolescents were aware regarding health problems related with obesity which increased to 90% after educational campaign. Overall a significant increase in knowledge regarding various nutrients and its sources was observed as a result of intervention.

Figure 1

Table 1: age and sex wise distribution of subjects(pre-intervention)

<table>
<thead>
<tr>
<th>Age (years)</th>
<th>Rural (Govt.) (n=155)</th>
<th>Urban (Govt.) (n=544)</th>
<th>Private (n=235)</th>
<th>Total (n=904)</th>
</tr>
</thead>
<tbody>
<tr>
<td>12</td>
<td>-</td>
<td>11 (21.9)</td>
<td>5 (2.1)</td>
<td>16 (1.8)</td>
</tr>
<tr>
<td>12</td>
<td>5 (3.2)</td>
<td>75 (4.6)</td>
<td>40 (17.0)</td>
<td>120 (12.2)</td>
</tr>
<tr>
<td>14</td>
<td>75 (21.9)</td>
<td>137 (26.0)</td>
<td>85 (27.7)</td>
<td>255 (25.9)</td>
</tr>
<tr>
<td>15</td>
<td>177 (21.5)</td>
<td>251 (56.4)</td>
<td>125 (25.2)</td>
<td>553 (58.9)</td>
</tr>
</tbody>
</table>

Sex

<table>
<thead>
<tr>
<th>Sex</th>
<th>Male (n=263)</th>
<th>Female (n=430)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>257 (50.0)</td>
<td>48 (49.0)</td>
</tr>
<tr>
<td>Female</td>
<td>113 (51.9)</td>
<td>49 (48.1)</td>
</tr>
</tbody>
</table>
Figure 2
Table 2: distribution of adolescents according pattern of bringing tiffin and contents of tiffin (on day of interview)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Rural (Govt.)</th>
<th>Urban (Govt.)</th>
<th>Private</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>PRE (n=155)</td>
<td>PRE (n=149)</td>
<td>PRE (n=110)</td>
<td>PRE (n=314)</td>
</tr>
<tr>
<td></td>
<td>POST (n=205)</td>
<td>POST (n=204)</td>
<td>POST (n=204)</td>
<td>POST (n=613)</td>
</tr>
<tr>
<td>Yes</td>
<td>216 (67.7)</td>
<td>109 (68.7)</td>
<td>110 (63.6)</td>
<td>335 (67.1)</td>
</tr>
<tr>
<td>No</td>
<td>129 (32.3)</td>
<td>53 (31.3)</td>
<td>59 (36.4)</td>
<td>241 (32.9)</td>
</tr>
</tbody>
</table>

Contents of Tiffin

<table>
<thead>
<tr>
<th>Vegetable / non-vegetable</th>
<th>Rural (Govt.)</th>
<th>Urban (Govt.)</th>
<th>Private</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>PRE (n=189)</td>
<td>PRE (n=110)</td>
<td>PRE (n=110)</td>
<td>PRE (n=314)</td>
</tr>
<tr>
<td></td>
<td>POST (n=204)</td>
<td>POST (n=204)</td>
<td>POST (n=204)</td>
<td>POST (n=613)</td>
</tr>
<tr>
<td>PanCake/Chapati</td>
<td>23 (12.1)</td>
<td>118 (52.4)</td>
<td>82 (74.5)</td>
<td>223 (62.6)</td>
</tr>
<tr>
<td>Rice</td>
<td>1 (0.5)</td>
<td>4 (2.2)</td>
<td>4 (3.7)</td>
<td>9 (2.7)</td>
</tr>
<tr>
<td>Vegetables</td>
<td>-</td>
<td>-</td>
<td>2 (1.8)</td>
<td>2 (1.6)</td>
</tr>
<tr>
<td>Cheese</td>
<td>-</td>
<td>-</td>
<td>2 (1.8)</td>
<td>2 (1.6)</td>
</tr>
<tr>
<td>Sandwich</td>
<td>-</td>
<td>9 (4.7)</td>
<td>6 (5.4)</td>
<td>15 (4.8)</td>
</tr>
<tr>
<td>Chinese</td>
<td>-</td>
<td>3 (1.6)</td>
<td>3 (2.7)</td>
<td>6 (2.0)</td>
</tr>
<tr>
<td>Water/Finger Chips</td>
<td>1 (0.5)</td>
<td>8 (3.7)</td>
<td>8 (7.2)</td>
<td>17 (5.4)</td>
</tr>
<tr>
<td>Fruits</td>
<td>5 (2.6)</td>
<td>8 (3.7)</td>
<td>8 (7.2)</td>
<td>21 (6.7)</td>
</tr>
<tr>
<td>Others</td>
<td>1 (0.5)</td>
<td>38 (17.5)</td>
<td>5 (4.5)</td>
<td>43 (13.7)</td>
</tr>
</tbody>
</table>

Figure 3
Table 3: knowledge of subjects regarding possible problems of overeating junk food (pre-intervention)

<table>
<thead>
<tr>
<th>Problem</th>
<th>Rural (Govt.)</th>
<th>Urban (Govt.)</th>
<th>Private</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>PRE (n=155)</td>
<td>PRE (n=149)</td>
<td>PRE (n=110)</td>
<td>PRE (n=314)</td>
</tr>
<tr>
<td></td>
<td>POST (n=205)</td>
<td>POST (n=204)</td>
<td>POST (n=204)</td>
<td>POST (n=613)</td>
</tr>
<tr>
<td>No</td>
<td>56 (36.1)</td>
<td>198 (38.5)</td>
<td>665 (72.4)</td>
<td>919 (35.2)</td>
</tr>
<tr>
<td>Yes</td>
<td>99 (63.9)</td>
<td>316 (61.5)</td>
<td>259 (27.6)</td>
<td>574 (64.8)</td>
</tr>
</tbody>
</table>

Specific problems encountered

<table>
<thead>
<tr>
<th>Problem</th>
<th>Rural (Govt.)</th>
<th>Urban (Govt.)</th>
<th>Private</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>PRE (n=155)</td>
<td>PRE (n=149)</td>
<td>PRE (n=110)</td>
<td>PRE (n=314)</td>
</tr>
<tr>
<td></td>
<td>POST (n=205)</td>
<td>POST (n=204)</td>
<td>POST (n=204)</td>
<td>POST (n=613)</td>
</tr>
<tr>
<td>Heart disease</td>
<td>10 (6.5)</td>
<td>60 (11.6)</td>
<td>10 (9.1)</td>
<td>80 (2.6)</td>
</tr>
<tr>
<td>Vomiting</td>
<td>4 (2.6)</td>
<td>97 (18.4)</td>
<td>21 (3.5)</td>
<td>122 (4.0)</td>
</tr>
<tr>
<td>Insomnia</td>
<td>46 (46.4)</td>
<td>69 (20.3)</td>
<td>14 (4.2)</td>
<td>129 (22.3)</td>
</tr>
<tr>
<td>Obesity</td>
<td>11 (11.7)</td>
<td>86 (27.2)</td>
<td>50 (15.9)</td>
<td>147 (25.1)</td>
</tr>
</tbody>
</table>

DISCUSSION

In the present study that has the representation of adolescents from all strata, showed overall poor nutritional status of them along with poor dietary habits. The most affected were rural adolescents and girls. The pattern of bringing tiffins was not widely observed. But after the intervention number of subjects getting tiffins increased from 1/3rd in the pre-intervention to ½ in the post intervention phase. Even the number of students who were not in habit of bringing tiffins to school decreased by 20%. For inculcating this habit there has to be role of mothers, teachers and schools. Parents especially mothers should insist the child to take tiffin. As these days majority of
mothers are working, but still they should make an effort of making their tiffin so that health of child doesn't suffer. Similarly, school should promote this pattern and some penalty should be enforced to children who are not getting tiffin to the school.

Another finding so evident was that subjects were not particular about the nutritious content of the tiffin. As this study was done in the northern part of India. So local culture based parantha (stuffed chapatti) was in the tiffin of majority of subjects. But only a few were getting vegetables or fruits. Most of the students preferred fast food in their tiffins over regular meals. Junk food (wafer and chips) was mostly taken by students of private schools. Fast food was favourable owing to its taste and of novelty factor due to peer pressure in schools. Similar findings were found by Klondaridou, Brown K, who found that young consumers prefer consuming tasty and attractive food without paying attention to the dietary value. So, measures have to be taken by mothers in making the tiffin tasty. These days many recipe books for attractive, tasty, nutritious food are coming in the market like that of Tarla Dalal, Sanjeev Kapoor, the famous chef and “Tiffin recipes for children” by Nita Mehta. Not only this even on internet there are particular sites for time saving, nutritious recipes for children's breakfast. Now, modern housewife and mothers especially, those who are working have many options.

The school environment is recognized as having a powerful influence on students eating behaviour. This fact has been recognized in many studies. After this study many schools showed a positive response. At present in Chandigarh in many schools, students are not allowed to take junk food everyday for their tiffin, rather a specific day is termed as junk food day, when they have the liberty to have it. Also in some school canteens, a ban is put on keeping fast food. Now hobby clubs in many schools include cookery clubs where preparation of healthy snacks are taught. Even in medical colleges/schools students are promoted to have stalls of their self made preparations or attractive yet nutritious fruit chats etc in their annual fete. Not only this as this study was done in collaboration with food and nutrition department they too promoted safe, hygienic, cheap, time saving nutritious recipes for all age groups.

Another interesting finding in our study was that 80% of respondents knew about the calories provided by junk food but awareness pertaining to the nutritive content of certain food items and usefulness of fruits and vegetables was less. These results have been corroborated in other studies. Brown K found the nutritional awareness to be low in young consumers. Similarly results were obtained by Adams and Gallagher, who had found the knowledge of adolescents regarding vitamin content in certain oils and vegetables to be low in their studies.

FFFRA(Frequency of fast food restaurant use) is increasing these days by adolescents. Eating away from home is becoming more common and fast food restaurant use in particular is growing even more rapidly in adolescents. French SA found that fast food outlets were very popular in adolescents. On an average FFFRA was three times /week. Lin BH found that food consumed in fast food restaurants was usually higher in fat content, lower in fruit and vegetables and other healthful nutrients.

Consumption of junk food and fast food fuels the occurrence of many diseases. The common being indigestion, obesity, cardiac problems, cancer especially colon cancer and breast cancer. A lot of research in developed countries has shown the correlation of them. Around 1/6th of adolescents in the present study could mention some diseases.

Anaemia, the major public health problem in India with prevalence of 60-90% in varied age groups is commonly seen during adolescent growth spurt due to poor dietary intake. Widespread prevalence of anaemia and its repercussions on growth has been well reported in literature. Aggarwal and Nelson documented the prevalence to be 46.5% in Delhi and 63.3% in Bombay respectively. This was high as reported by Mehta, 21, 27%. Present study results were almost similar to that of above studies. 1/4th of adolescents were anaemic, girls being affected more than boys.

The current situational analysis regarding awareness of nutritional food calls for the need to start the interventional programmes as well as studies to promote the pattern of healthy diet. Emphasis has to be laid not only on young adolescents but also on general population. Many efforts in this direction have already been taken till date in India. The Union Health Ministry planned a blanket on junk food and cola drinks in school and university canteens all over the country in 2006. Union Health minister Ambumani Ramadoss had urged bollywood superheroes and sportspersons to stop promoting carbonated beverages which have an
“adverse impact on the health of society. Even Civil Supplies and Consumer Protection Department had written to school education officials throughout India, urging a total ban on the sale and promotion of junk food in school canteens.

Reinaerts \(^{22}\) did a school based interventional project with intention to promote fruit and vegetable (F&V) consumption. A good percentage of dutch students showed an increased consumption of F&V at the end of study. Many interventional studies were done on general population to \(^{23-25}\) with an intention to find the co-relation of dietary fat consumption with cancer or cardiac diseases.

The present study revealed that there was a gap between the awareness pertaining to nutritious diet and the practice of consuming, that the interventional steps so taken did increase the knowledge of balanced diet along with hazards of unbalanced diet.

References

22. Reinaerts et al. Development of a school based intervention to promote fruit and vegetable consumption. Health Education 2006;5:345-56
Author Information

Sonia Puri, MBBS, MD, DGO
Assistant Professor, Deptt of community medicine, GMCH-32

Vikas Bhatia, MBBS, MD
Reader, Deptt of community medicine, GMCH-32

HM Swami, MBBS, MD
Prof and Head, Deptt of community medicine, GMCH-32

Sanjay Rai, MBBS, MD
Deptt of community medicine, GMCH-32

Chetna Mangat, MBBS
Deptt of community medicine, GMCH-32