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Assessment of food intake pattern and effect of nutrition education on adolescents of Uttarakhand

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Abstract

The present study was carried out on 1479 adolescents of 11 to 18 years of age. The sample was selected from three different government schools of district Udham Singh Nagar, Uttarakhand. The food consumption pattern of the adolescents was assessed through food frequency questionnaire. The food consumption pattern indicated poor consumption of milk, fruit and pulses. Due to low consumption of important nutrients, the adolescents are at higher risk of nutrient deficiency diseases. The existing nutritional knowledge of adolescents was assessed with the help of a questionnaire. For assessing the existing knowledge of nutrition a pre test was conducted in which nutrition and health related questions were included. After conducting pre test, nutrition education was imparted to the adolescents. After imparting education post test was conducted and the data collected was analyzed. Results revealed that the increment in knowledge level of adolescents was 42.27 percent. It can be concluded that nutrition education has positive effect on nutritional awareness level and it will help the adolescents to understand the requirements of their age which will further help them to be happy and healthy throughout their lives.

Keywords: Adolescents, nutrition education, Uttarakhand

Introduction

Adolescence is a transitional stage of physical and psychological development that generally occurs during the period from puberty to adulthood. Adolescence is usually associated with the teenage years, but its physical, psychological or cultural expressions may begin earlier and end later. During adolescence the rate of physical growth increases rapidly. This sudden growth spurt is associated with hormonal, cognitive and emotional changes that make adolescence an especially vulnerable period of life. There is a greater demand for nutrients due to the rapid increase in physical growth and development over a relatively short period of time. Total nutrient needs are higher during adolescence than any other time in the lifecycle. Adolescence is a time of changing lifestyles and food habits that affect both nutrient needs and intake and adolescence drive for individuation means more opportunity to assert food choice and expand or narrow healthy options. Adolescents are highly susceptible to nutritional deficiencies and poor eating habits which may lead to problems later on in life so there is a need of special attention as adolescence is characterized by a tremendous pace in growth and change. Failure to consume an adequate diet at this time can result in delayed sexual maturation and can arrest or slow linear growth. Nutrition is also important during this time to help prevent adult diet-related chronic diseases such as cardiovascular disease, cancer, and osteoporosis. Therefore, to raise the awareness regarding nutrition and health among adolescents, there is a need of proper nutrition education programme. Hence, the present study was undertaken to assess the general food intake pattern and existing nutritional knowledge of adolescents and to impart nutrition education to them to raise their knowledge levels.

Materials and methods

Present study was carried out on the sample size of 1479 adolescents of 11 to 18 years of age from class 6th to 12th. Three different government schools of district Udham Singh Nagar, Uttarakhand were selected for the study. For assessing the food habits, food frequency questionnaire was used. To determine the existing knowledge of nutrition a pre test was conducted in which fifteen questions about food and nutrition were there.

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After conducting pre test, nutrition education was imparted to the adolescent girls through lecture cum discussion method. In the nutrition education programme books and flip charts were used as nutrition education material. The books contained five chapters having information related to food, nutrients and their functions, balanced diet, healthy cooking practices, exercise, personal hygiene and sanitation etc. In each selected class, total six days session was carried out for the duration of two hours which included five teaching sessions and one closing session. During the first teaching session pre test was conducted and then books were distributed among the students and first chapter was discussed. After conducting five days teaching session a post test having same questions as the pre test was conducted during the closing session. The collected data were analyzed and knowledge increment percent was calculated. The knowledge increment percent was calculated by the following formula.

$$KI\% = \frac{\text{post test score} - \text{pre test score}}{\text{post test score}} \times 100$$

Results and discussion

Table 1 inferred the general food pattern of the adolescents of a day which was determined by the food frequency questionnaire method. In the present study very low consumption of fruits was observed. Only 1.08 percent students consumed fruit in a day. The study is in line with the study conducted by Singh *et al.* (2017) [5] in Uttarakhand which also revealed that adolescent girls were consuming less amount of fruits daily. It was good to see that large number of study population (73.63percent) were consuming green leafy vegetables on daily basis. Results also revealed that only 11.09 percent students consume pulses daily. It was seen that

10.41 percent adolescents consume milk daily. Similar study conducted on 400 adolescents by Deka *et al.* (2015) [2] in the urban areas of Jhansi district in Uttar Pradesh also revealed that most of the adolescents did not consume milk and fruits as daily food. Another study done by Venkaiah *et al.* (2015) [7] on rural adolescents in Orissa found that more than half of the rural adolescents were not consuming fruits, fish, meat and poultry and milk and milk products. Low consumption of milk, fruits and eggs among adolescents may be due to low purchasing capacity among the study population.

Table 1: Food items consumed daily by adolescents

Food groups	No. and % of students (N=1479)
Milk	154 (10.41%)
Pulse	189 (12.78%)
GLV's	1089 (73.63%)
Fruits	16 (1.08%)
Egg	31 (2.10%)

Under nutrition education programme it was seen that average knowledge increment was 42.27 percent. In the present study the class wise average knowledge increment percent across all the three schools was also calculated. It was seen that the average knowledge gain in percent for 6th, 7th, 8th, 9th, 10th, 11th and 12th class was 41.74, 43.24, 43.21, 43.57, 40.94, 38.97 and 42.07 percent respectively (Table 2). It shows the positive effect of nutrition education. Study done by Singh *et al.* (2013) [6] on school going adolescent girls of Udham Singh Nagar district of Uttarakhand also found positive impact of nutrition education on girls. Also, the present study results are in line with an earlier study of Jain and Chawla (1999) [3] who concluded that there is a positive effect of nutrition education on adolescent girls.

Table 2: Knowledge increment percent

Name of the School	Knowledge increment (%)							Average knowledge increment (%)
	6 th	7 th	8 th	9 th	10 th	11 th	12 th	
G.I.C. Sakainia	46.85	54.59	47.89	41.88	38.77	35.79	48.33	44.87
G.I.C. Kelakheda	38.11	34.85	33.27	45.27	43.12	42.15	35.81	38.94
Higher secondary School Haldi	40.25	40.27	48.46	-	-	-	-	42.99
Average KI % across schools	41.74	43.24	43.21	43.57	40.94	38.97	42.07	42.27%

The students were divided into 4 grades according to the knowledge increment percentage i.e. grade IV (< 30 % KI), grade III (30-50 % KI), grade II (50-70% KI) and grade I (above > 70% KI). It was observed that 483 students were in the grade IV, 396 students in the grade III, 395 under II and 205 were in the grade I (Table 3). It can be inferred from the data that positive change has been found after imparting

nutrition education. Fallah *et al.* (2013) [2] also concluded nutritional education has a positive impact on nutritional awareness. Also, study conducted by Lua and Elena (2012) [4] revealed that nutrition education appeared to be the best method for enhancing eating habits and promoting healthier diets and lifestyles.

Table 3: Distribution based on Knowledge Increment % (KI %) scores

Name of the School	Total no. of students	Number of students with KI% < 29.9% Grade-4	Number of students with KI% (30-49.9%) Grade-3	Number of students with KI% (50-69.9%) Grade-2	Number of students with KI% ≥ 70% Grade-1
G.I.C. Sakainia	562	171	126	164	101
G.I.C. Kelakheda	731	265	213	169	84
Higher secondary School Haldi	186	47	57	62	20
Total no. of students	1479	483	396	395	205

Conclusion

Adolescence is a crucial time between childhood and adulthood that includes the biological changes of puberty. This age group needs special attention because of the different

stages of development that they undergo. It was observed in the study that the consumption of protective food group was less among the adolescents. Due to inadequate consumption of important food groups, the adolescents are at higher risk of

nutrient deficiency diseases. For example low calcium consumption will sooner or later leads to low bone density. Due to low protein intake the adolescents are more likely to be underweight. After assessing the food consumption pattern of adolescents it was concluded that there is a need of proper nutrition education programme for the adolescents. If nutrition education is imparted to the adolescents it will help them to understand the requirements of this age which will further help them to be happy and healthy throughout their lives. In the present study results revealed that majority of the school going adolescents before imparting nutrition education had low levels of awareness about the nutrition. The reason for low level of nutrition awareness might be low socioeconomic background and less education in the family. It was seen that educating the adolescents at this stage is very significant to raise their knowledge level. The average knowledge increment of students across all the schools was 42.27 percent. Overall it can be concluded that there was a positive impact of nutrition education on adolescents.

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