

Dietary assessment and role of nutrition education in creating nutrition awareness among adolescent girls

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ABSTRACT : The present study was carried out for six months to assess the dietary pattern, existing knowledge about the nutrition and its importance among the adolescent girls and impact of nutrition education on the knowledge increment. A sample size of 2446 adolescent girls of 10 to 17 years of age was selected from three different government schools of district Udham Singh Nagar, Uttarakhand. The dietary pattern of the girls was assessed through 24 hour recall method. Mean intake of calorie, protein, fat, iron, thiamine, riboflavin and niacin were lower than the Recommended Dietary Allowances. The dietary pattern indicated poor consumption of milk, fruit, meat and green leafy vegetables. Due to low consumption of important nutrients the adolescents girls are at higher risk of nutrient deficiency diseases. The 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 questions related with nutrition were there. After conducting pre test, nutrition education was imparted to the adolescent girls through lecture cum discussion method, thereafter post test was conducted and the data collected was analyzed and the results revealed that the per cent increment in knowledge level of adolescents was 46.19 per cent. Thus, nutrition education intervention seems to have a positive effect on nutritional awareness level which would eventually encourage expansion of knowledge and positive nutrition and health habits.

Key words: Dietary assessment, knowledge increment, nutrition education

The girls constitute a more vulnerable group especially in the developing countries where they are traditionally married at an early age and are exposed to greater risk of reproductive morbidity and mortality. Nutritional deficiencies have far reaching consequences, especially in girls. If their nutritional needs are not met, they are likely to give birth to undernourished children, thus transmitting under nutrition to future generation. During period of puberty, the body has increased need for calories, and nutrients like protein, calcium, iron, folate, zinc, vitamin B complex and vitamin C are important nutrients during school age (Swarnalata and Yegammai, 2006). Malnutrition prevails in rural area due to low economic status, less awareness about healthy diet of girls. Hence it is essential to assess the nutritional status of girls, especially in rural area. Health and nutrition in early stages of human life determine to a great extent the physical and mental well being of a person. An important way to maintain the personal health is to have a healthy diet. Nutrition education has been defined as educational measures for indicating desirable behavioural changes for the ultimate importance in the nutritional status of all nutrition intervention programme (Deshpandey *et al.*, 2003). Nutritional awareness is also important today in India as many young girls and woman are malnourished and anemic (Chawal *et al.*, 2005). Therefore, to raise the

awareness regarding nutrition and health among girls there is a need of proper nutrition education programme. In view of the above, the present study was formulated with the objective to assess the nutritional and health awareness of school going girls (10 to 17 years) of government schools of district Udham Singh Nagar, Uttarakhand and to educate the school going girls about nutrition and health.

MATERIALS AND METHODS

In the present study sample size of 2446 adolescent girls of 10 to 17 years of age from class 6th to 12th was selected from three different government schools of district Udham Singh Nagar, Uttarakhand. The study was carried out from November 2015 to March 2016. For assessing the food habits and dietary pattern of the adolescent girls, 24 hour recall method was used and data was collected. To determine the existing knowledge of nutrition a pre test was conducted in which fifteen questions were there. After conducting pre test, nutrition education was imparted to the adolescent girls through lecture cum discussion method. In the nutrition education programme colorful and attractive books in hindi language 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, correct cooking practices, personal hygiene and sanitation etc. In each selected class total six days session was carried out for the duration of one hour 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 girls 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 was analyzed and knowledge increment per cent was calculated. The knowledge increment per cent 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 24 hour recall method. In the present study very low consumption of fruits was observed. Only 0.73 per cent girls consumes fruit in a day. Meat consumption was observed by only 1.75 per cent girls. No consumption of milk and green leafy vegetables was observed. It was seen that 84 per cent of the adolescent girls were having wheat and rice daily as main energy source. Similar study conducted on 400 adolescents by Deka *et al.* (2015) in the urban areas

of Jhansi district in Uttar Pradesh also revealed that most of the adolescents did not consume green leafy vegetables, milk products, fruits, and liver and majority of the participants consumed chapati (94.5%) and rice (81.2%) as daily food. Another study done by Venkaiah *et al.* (2015) on rural adolescents in Orissa found that more than half of the rural adolescents were not consuming green leafy vegetables, fruits, fish, meat and poultry and milk and milk products. Low consumption of green leafy vegetables among adolescents may be due to non availability and low purchasing capacity among the study population.

The girls were divided into three groups according to their age i.e. 10-12 years, 13-15 years and 16-17 years. The nutrient intake was calculated and compared to the RDA (ICMR, 2010). It was observed that the consumption of all the nutrients was less than recommended dietary allowance by most of the adolescent girls in all the three groups (Table 2). The present study is in line with the earlier study done by Deka *et al.* (2015) in the urban areas of Jhansi district in Uttar Pradesh who concluded that mean intake of calorie, protein, fat and iron were lower than the Recommended Dietary Allowances among the adolescents and more than 50% of the participants had calorie consumption less than RDA. Also study conducted by Venkaiah *et al.* (2015) revealed that about 70-90 per cent of the adolescents were not meeting even 50 per cent of RDI for various nutrients such as iron and riboflavin.

Table 1: General pattern of food items consumed in a day

Food groups	No. and % of girls (N=2446)
Wheat	2054(84%)
Rice	1861 (76%)
Pulse	1597 (65.29%)
Vegetables (other than GLV's)	2022 (82.66%)
Fruits	18 (0.73%)
Meat	43 (1.75%)
Egg	44(1.79%)

Table 2: Nutrient consumption by the girls as compared to RDA

Nutrients	10-12 years (N=596)		10-12 years (N=596)		16-17 years (N=284)	
	RDA (2010)	Percent of girls consuming nutrients less than RDA	RDA (2010)	Percent of girls consuming nutrients less than RDA	RDA (2010)	Percent of girls consuming nutrients less than RDA
Energy (Kcal)	2010	81.95%	2330	84.89%	2440	87.8%
Protein (g)	40.4	86.09%	51.9	89.18%	55.5	87.15%
Fat (g)	35	75%	40	94.79%	35	89.83%
Iron (mg)	27	95.63%	27	84.09%	26	93.2%
Thiamine (mg)	1.0	86.4%	1.2	65.34%	1.5	71.72%
Riboflavin(mg)	1.2	60.06%	1.4	79.42%	1.8	78.13%
Niacin(mg)	13	68.28%	14	90.14%	14	82.45%

Table 3: Distribution of students based on pre test scores out of 15

S. No	Name of school	Total number of students	Pre test score	
			0-7	8-15
1	Junior High School, Nagla	261	225 (86.20%)	36 (13.79%)
2	G.G.I.C, Pantnagar	720	457 (63.47%)	263 (36.50%)
3	G.G.I.C, Kichha	1465	442 (30.17%)	1023 (69.68%)
	Total	2446	1124 (49.95%)	1322 (54.04%)

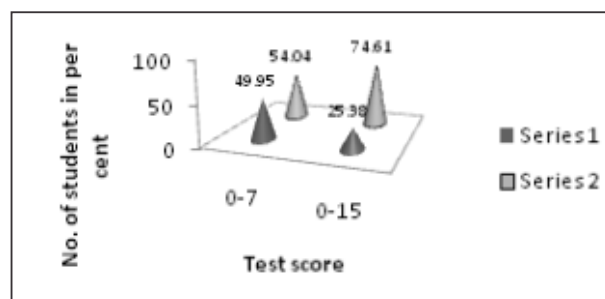
Table 4: Distribution of students based on post test scores out of 15

S. No	Name of school	Total number of students	Pre test score	
			0-7	8-15
1	Junior High School, Nagla	261	99(37.93%)	162(62.06%)
2	G.G.I.C, Pantnagar	720	297(41.25%)	423(58.75%)
3	G.G.I.C, Kichha	1465	225(15.35%)	1240(84.64%)
	Total	2446	621(25.38%)	1825(74.61%)

Under nutrition education programme it was seen that before imparting nutrition education 49.95 percent of students scored marks between 0-7 and 54.04 percent of students scored marks between 8-15 in pre test score but after imparting nutritional knowledge 25.38 percent of students scored marks between 0-7 and majority of students i.e. 74.61 percent of students scored marks between 8-15 (Table 3 and 4) (fig 1). It shows the positive effect of nutrition education. Study done by Singh et al (2013) 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) who concluded that there is a positive effect of nutrition education on adolescent girls.

The students who had taken both pre test and post test 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 524 students were in the grade IV, 810 students in the grade III, 543 under II and 569 were in the grade I (Table 5). The knowledge increment percentage for each student after the end of all the teaching sessions was calculated and it was observed that the average knowledge increment across all the three schools was 46.19 percent. In the present study the class wise average knowledge increment per cent across all the three schools was also calculated. It was seen that the average knowledge gain in per cent for 6th, 7th, 8th, 9th, 10th, 11th and 12th was 51.66, 44.54, 45.69, 49.81, 41.06, 43.1 and 41.52 per cent respectively (Table 6). It can be inferred from the data that positive change has been found after imparting nutrition education. Fallah *et al.* (2013) also concluded nutritional education have a positive impact on nutritional awareness. Also, study conducted by Lua and Elena (2012) revealed that nutrition education appeared to be the best method

**Fig 1:** Distribution of students based on pre and post test scores**Table 5: Distribution of students based on Knowledge Increment % scores**

Name of school	Total no. of Students	No. of students with KI% < 30%	No. of students with KI% (30-50%)	No. of students with KI% (50-70%)	No. of students with KI% (>70%)
		Grade-4	Grade-3	Grade-2	Grade-1
1 Junior High School, Nagla	261	102	50	-	109
2 G.G.I.C , Pantnagar	720	320	400	-	-
3 G.G.I.C , Kichha	1465	102	360	543	460
Total number of students	2446	524	810	543	569

Table 6: Knowledge Increment % of girls across all classes of all schools

Class & Age group	Knowledge Increment							Average KI % across all schools
	6 th	7 th	8 th	9 th	10 th	11 th	12 th	
1 Junior High School, Nagla	66.80	42.04	43.03	63.34	41.39	-	-	51.32
2 G.G.I.C, Pantnagar	40.23	41.34	44.73	42.12	40.25	41.25	42.25	41.73
3 G.G.I.C, Kichha	47.95	50.25	49.32	43.97	41.56	44.95	40.79	45.54
Average KI	51.66	44.54	45.69	49.81	41.06	43.1	41.52	46.19

for enhancing eating habits and promoting healthier diets and lifestyles.

CONCLUSION

Adolescence is a critical transitional period between childhood and adulthood that includes the biological changes of puberty. This age group needs special attention because of the chaos of adolescence which they face due to the different stages of development that they undergo. It was observed in the study that the nutrient intake of most of the adolescent girls was less than recommended dietary allowances. Due to low consumption of important nutrients the adolescents girls are at higher risk of nutrient deficiency diseases. For example low iron consumption will sooner or later leads to anemia. Due to low calorie and protein intake the girls are more likely to be underweight. If nutrition education is imparted to the adolescents it will help them to understand the needs and requirements of this age which will further help them to be healthy throughout their lives. In the present study results revealed that majority of the school going girls before imparting nutrition education had either poor or average levels of awareness about the nutrition and effect of nutrition on the health. Low socioeconomic background and less education in the family might be the reason for this low level of awareness. It was seen that educating the adolescent girls at this stage is very important to raise their knowledge level. The average knowledge increment of girls across all the schools was 46.19 per cent. It can be concluded from the study that there was a positive impact of nutrition education on adolescent girls.

ACKNOWLEDGEMENTS

The authors thank Govind Ballabh Pant University of Agriculture and Technology, Pantnagar, Uttarakhand and Nestle India Pvt. Ltd. for providing the finance and other support required for this research work.

REFERENCES

Chawal P.K, Sharma S and Sachdeva R. (2005). Impact of Nutrition Counseling on Anthropometric

Parameters of School Girls (7-9 years). *Journal of Dairying, Food and Home Science*, 24 (1):54-58.

Deka, M., Malhotra, A. K., Yadav, R. and Gupta, S. (2015). Dietary pattern and nutritional deficiencies among urban adolescents. *Journal of Family Medicine and Primary Care*, 4(3): 364–368.

Deshpandey, S., Mishra, A. and Mishra, M. (2003). Nutritional profile of farm women of Madhya Pradesh and impact of nutrition education on the inclusion of soyabean products. *Indian Journal of Nutrition and Dietetics*, 40 (5): 185-187.

Fallah, F., Pourabbas, A., Delpisheh, A., Veisani, Y. and Shadnoush, M. (2013). Effects of Nutrition Education on Levels of Nutritional Awareness of Pregnant Women in Western Iran. *International Journal of Endocrinology Metabolism*, 11(3): 175–178.

Jain, R. and Chawla, P. (1999). Effect of Nutrition Education on Food and Nutrient intake of School girls: XXXII Ann. Convention, IDA, New Delhi.

Lua, P. L. and Elena, W. (2012). The Impact of Nutrition Education Interventions on the Dietary Habits of College Students in Developed Nations: A Brief Review. *The Malaysian Journal of Medical Sciences*, 19(1):4–14.

Singh, P., Singh, R., Joshi, P., Pant, S. and Raghuvanshi, R. S. (2013). Creating awareness on nutrition and health among rural adolescent girls of district Udham Singh Nagar, Uttarakhand. *Pantnagar Journal of Research*, 11(3):457-460.

Swarnalata, A. and Yegammai, C. (2006). Impact of iron, vitamin A and vitamin C supplementation on anaemic adolescent girls. *Indian Journal of Nutrition and Dietetics*, 43(6): 229-237.

Venkaiah, K., Brahmam, G.N.V. and Vijayaraghavan, K. (2015). Identification of dietary patterns by factor analysis and study of the relationship with nutritional status of rural adolescents using factor scores. *Journal of Health, Population and Nutrition*, 34:7.

Received: April 8, 2017
Accepted: April 20, 2017