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Effect of nutrition education programme on adolescents girls in Uttarakhand state

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Abstract
The present study was carried out on 511 adolescents of 13 to 17 years of age. The sample was selected from government school of district Udham Singh Nagar, Uttarakhand. A comprehensive and exhaustive questionnaire was formulated specifically keeping in mind the objectives of the study. The existing nutritional knowledge of adolescents was assessed with the help of a questionnaire which comprised of 15 multiple choice question and each questions carrying one marks in which student had to choose one correct answer. For assessing the existing knowledge of nutrition a pre-test was conducted in which nutrition and health related questions were included and after conducting pre-test, nutrition education was imparted to the adolescents. After imparting nutrition education post test was conducted and the data collected was analyzed. Results revealed that the increment in knowledge level of adolescents was 41.03 per cent. 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, knowledge, questionnaire

Introduction
Good nutrition contributes significantly to reducing episodes of illness and improving school retention and concentration. Nutrition education in schools includes both the food and nutrition facts appropriate to the need of the peoples and evaluation of the educational program's effectiveness. Nutrition education should encourage thepeople's motivation and increase knowledge, awareness and skills in making informed decision about diet and nutrition practices. Nutrition education as one of the important practical aspects of nutrition knowledge, it plays an important role in raising public awareness and ultimately health of society (Berino *et al.,* 1997) [3]. Nutrition education in school plays an important role in shaping child's food choices and ultimately health and performance. The importance of proper nutrition as one of the important aspects of lifestyle were emphasized in the recent years and the trend toward healthier diets has increased (Margetts *et al.* 1998) [7]. This mean that increasing nutritional knowledge among adolescence girls can be a good strategy to employ in the reduction and control of certain health condition.

Adolescence is the only time falling infancy when the rate of physical growth actually increases. This sudden growth spurt is associated with hormonal, cognitive and emotional changes that make adolescence an especially vulnerable period of life (singh *et al*., 2017) [8].

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. In the case of malnourished adolescent's girls, nutritional problems not only hampered their physical work capacity but it adversely affects their reproductive outcome (WHO 1998). 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 511 adolescents of 13 to 17 years of age from class 9th to 12th. In government school of district Udham Singh Nagar, Uttarakhand was selected for the study. For evaluation of knowledge increment among the adolescents girls and used of questionnaire as a tool for assessing the knowledge increment. To determine the existing knowledge of nutrition a pre-test was conducted in which fifteen questions about food and nutrition were there. 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 per cent was calculated. The knowledge increment per cent was calculated by the following formula

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

Results and Discussion

Table 1 inferred that under nutrition education programme it was seen that average knowledge increment was 41.03 per cent. In the present study the class wise average knowledge increment per cent across school was also calculated. It was seen that the average knowledge gain in per cent for 9th, 10th, 11th and 12th class was 45.70, 39.00, 37.41, and 42.01, 40. per cent respectively (Table 1). It shows the positive effect of nutrition education. Study done by Singh *et al*., 2013 [8] 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) [5] who concluded that there is a positive effect of nutrition education on adolescent girls.

Table 1: Knowledge Increment per cent

Name of School, Village and District	Knowledge increment (%)							Average knowledge increment (%)
	6th	7th	8th	9th	10th	11th	12th	
G.G.I.C Pantnagar	-	-	-	45.70	39.00	37.41	42.01	41.03
Average KI% across schools	-	-	-	-	-	-	-	41.03

Table 2: Distribution based on Knowledge Increment % (KI %) scores

Name of School, Village and District	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.G.I.C Pantnagar	511	142 (27.78%)	189 (36.98%)	133 (26.02)	47 (9.19%)

In Table 2 the students were divided into 4 grades according to the knowledge increment percentage i.e. grade IV (< 29.9 % KI), grade III (30-49.9 % KI), grade II (50-69.9% KI) and grade I (above > 70% KI). It was observed that 142 students were in the grade IV, 189 students in the grade III, 133 under II and 47 were in the grade I (Table 2). 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) [6] revealed that nutrition education appeared to be the best method for enhancing eating habits and promoting healthier diets and lifestyles.

Table 3: Knowledge Increment as per Class Attendance

Name of School, Village and District	Average knowledge increment in per cent as per No. of teaching sessions attended by students				
	1*	2*	3*	4*	5*
G.G.I.C Pantnagar	27.30	31.31	35.78	39.19	50.67

In table 3 It was seen that the average knowledge gain in five session of nutritional education programme was50.67 % followed by 39.19 % for four session, 35.78 % for three session, 31.31 % for two session and 27.30 % for one session and this revealed that students who attended five session of nutritional education programme gained more knowledge in comparison to other four, three, two, one session students. Our study is in the line of Hamdy *et al.*, 2006 [4] concluded that Student attendance is to be an important factor in the academic performance and integral part of professional development.

Table 4: Distribution of students of GGIC, Pantnagar based on pre and post test scores

Class	GGIC, Pantnagar						
	No. of students	Pre-test score out of 15			Post test score out of 15		
		0-5	6-10	11-15	0-5	6-10	11-15
9th	126	102(80.95%)	24(19.04%)	0	19(15.07%)	94(74.60%)	13(10.31%)
10th	124	91(73.38%)	33(26.61%)	0	24(19.35%)	91(73.38%)	9(7.25%)
11th	88	58(65.90%)	30(34.09%)	0	9(10.22%)	70(79.54%)	9(10.22%)
12th	173	124(71.67%)	49(28.32%)	0	15(8.67%)	132(76.30%)	26(15.02%)
Total	511	375 (73.38%)	136(26.61%)	0(0%)	67(13.11%)	387(75.73%)	57(11.15%)

Table 4 shows that in the pre-test 73.38 % of the students obtained marks in range 0-5, 26.61 % students scored marks between 6-10 whereas 0% students did not scored marks in range 11-15. A positive change has been found in the score of adolescents after imparting nutritional education. Study done by Singh *et al.*, 2017 [8] also found positive impact of nutrition education on adolescents girls. In post-test it was found that majority of students that is 11.15% scored marks between 11-15 followed by 75.73% students who scored marks between 6-10 and only 13.11% adolescent's score in range 0-5. The present study result are in line with an earlier study of Jain and Chawla (1999) [5] who concluded that there is the positive effect of nutrition education on adolescence girls.

Conclusion

It was concluded from this study that nutrition education significantly improved the nutritional status and health related behavior of the adolescent's girl and poor knowledge. Adolescence is a crucial time between childhood and adulthood that includes the biological changes of puberty. Nutritional requirements increase in adolescence. These increases are vital to enable adolescents to reach their full physical, cognitive and development potential in adulthood. Among adolescent girls the onset of menstruation results in a higher demand for nutrients such as iron, protein, calories, calcium, and vitamins. Overall it can be concluded that there was a positive impact of nutrition education on adolescents. It would not only improve the health of adolescent girls, but future generation will also influenced, as adolescent girls are would be mothers.

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