Impact of Nutrition Counseling on Consumption Pattern of Junk Foods and Knowledge, Attitudes and Practices among Adolescent Girls of Working Mothers

Priya Singla[*], Rajbir Sachdeva and Anita Kochhar

*Department of Food and Nutrition, College of Home Science, Punjab Agricultural University,
Ludhiana 141 001, Punjab, India
E-mail: [*]prsingla206@gmail.com*

ABSTRACT Sixty adolescent girls of working mothers aged 16-18 years who used to eat junk foods frequently were selected from two different schools in Ludhiana and divided equally into two groups viz. Experimental (E) and Control (C). The data on demographic information and junk food consumption pattern were recorded before and after nutrition counseling. Nutrition counseling was imparted for a period of three months through modules, lectures, visual aids in group E and was assessed by Knowledge, Attitudes and Practices (KAP) test before and after nutrition counseling. It was observed that 86.7 and 93.3 per cent of subjects spent their monthly pocket money on junk foods in group E and C and majority ate junk foods at least once a week. It was observed that junk foods contributed to 54 and 57 per cent and 50 and 52.20 per cent to total energy intake in group E and C before and after nutrition counseling respectively. It was observed that the mean scores for nutrition knowledge improved significantly (P≤0.01) in post test from 25.00 to 36.24 in group E, while non-significant (21.80 to 22.13) in group C. Majority of the subjects had moved towards high score with gain in scores and quantum of improvement was 11.24 and 1.45 times in group E respectively. It was concluded that nutrition counseling resulted in decreased intake of junk foods, rather they started eating healthy foods as taught during nutrition counseling sessions. There was also an improvement in scores of knowledge, attitudes and practices in group E. It was suggested that nutrition counseling should be given for longer duration to change their dietary habits.

INTRODUCTION

Junk foods are mainly made up by using a lot of saturated fats which are unhealthy after digestion and release a lot of toxins into the body. Moreover, it lacks vitamins and minerals which are necessary to have good health and immunity to fight diseases. Food habits are formed by attitudes, prejudices and taboos practiced in early days of life. Generally, the adolescents consume unconventional meals mostly disapproved by the senior family members. They have formed distinctive likes and dislikes of foods. The practice of high consumption of junk foods like maggi noodles, burgers, *pao-bhaji*, sandwiches, hot dogs, patties, pastries, popcorn, potato chips, carbonated drinks, biscuits, muffins, toast, *kulcha-channa, samosa*, chocolates etc. have become common feature of adolescent's diet (Singh and Singh 2008). Ill effects of regular intake of junk foods are mainly lack of energy, poor concentration and obesity leading to inferiority complex, depression, heart diseases, high cholesterol, stunted growth, premature ageing, and tooth decay (Chhibber 2010).

India, adolescents account 20 per cent of the total population (UNICEF 2011). Diet plays a major role in the promotion of health and well-being of an individual. A good and balanced diet improves the quality of life, while poor diet may lead to morbidity and diseases. Nutritional attitudes and beliefs impact food choices and nutritional adequacy. Food and nutrient intake are closely related to nutritional status and health of an individual. Adequate amount of nutrients in the form of daily diet are essential for the maintenance of health. The eating pattern of adolescents first increasingly gained attention in western countries in recent years. Owing to globalization and urbanization in developing countries, adolescents consume more dietary fats in comparison to fruits and vegetables (Puri et al. 2008).

India had the world's largest number of professionally qualified women. The mother's educational level is the one of the best predictors of the type and quality of child's diet, although the father's educational level also have an effect. Children of working mothers tend to consume more processed junk foods, fats, meat, milk, fish, green vegetables, less sugar and fruit juice where-

as, children of poorer families tend to consume high sugar and unhygienic foods (Fernandez 2006).

Nutrition counseling is a key element in promoting sustainable healthy eating behaviors. Adolescents often are not aware of the potential health risks associated with poor habits and have not thought about making dietary changes. Therefore, the goal of nutrition counseling is to increase adolescents' awareness of risks associated with current eating habits, to teach to eat well balanced diet that contain a variety of foods and to learn to make wise food choices independently. Nutrition issues that are especially amenable to group education methods include fast food, snack choices, sports nutrition and overweight (Stang and Story 2005). Module involves print media, like modules about importance of nutrition, which is a powerful medium for communicating to the masses in written form. It is the most popular because it is easy, comparatively cheaper and can be used according to the convenience of the learners. People usually have confidence in printed page as it can be read at leisure time, kept for future use also and have long lasting effect.

Adolescent girls and their mothers are ignorant about the ill effects of junk foods, right choice of healthy and nutritious foods in their daily diet. Nutrition counseling regarding the importance of having proper nutrition, balanced diet and the harmful effects of eating junk foods will help to curb the junk foods addiction and improving their nutritional and health status among adolescents. Hence, the present study has been undertaken to find out impact of nutrition counseling on knowledge, attitudes and practices and consumption pattern of junk foods among adolescent girls of working mothers.

MATERIAL AND METHODS

Selection of Subjects

A sample of 60 adolescent girls of working mothers aged 16-18 years who used to eat junk foods frequently were selected randomly from two different schools and divided equally into two groups viz. Experimental (E) and Control (C). Nutrition counseling was imparted to group E, while group C was not be given any nutrition counseling.

Nutrition Counseling

Nutrition counseling was imparted to the subjects of group E in the form of modules, as well as lectures, visual aids like charts and posters, flash cards and leaflets for a period of three months, that is, one counseling session fortnightly in vernacular language on the balanced diet, functions of different nutrients and their requirements, nutritional disorders, their control and prevention, cooking practices, importance of physical exercise, ill effects of junk foods and how to make junk foods healthy. Nutrition knowledge of the subjects was assessed by questionnaire based on Knowledge, Attitudes and Practices (KAP). After imparting nutrition counseling, nutrition knowledge was again assessed. For evaluating the questionnaire, one score was awarded for each correct and zero for each wrong answer.

Gain in Knowledge

Gain in knowledge was calculated using the following equation:
Gain in knowledge = score of post-test - score of pre-test
Quantum of improvement = Post test score/ Pre test score

Statistical Analysis of Data

The data on junk foods intake and KAP scores was analyzed statistically by using appropriate statistical tools such as mean and percentage. To test the significance student's t-test was applied using Microsoft Excel computer programme package on all the parameters (Singh et al. 2004).

RESULTS AND DISCUSSION

Demographic Information of the Subjects

Table 1 depicted the demographic information of the subjects. In the present study, 50 and 26.6 per cent of the subjects fell in age group of 16 years, followed by 17 years, that is, 36.7 and 53.4 per cent and rest were in 18 years. It was also observed that majority of fathers (60 and 60 per cent) and mothers (80 and 50 per cent) were involved in service, while 13.3 and 33.3 per cent of fathers were engaged in business and 20 and

Table 1: Demographic information of the subjects

Parameters	Group E (n=30)		Group C (n=30)	
	Frequency	*Percentage*	*Frequency*	*Percentage*
Age (years)				
16	11	36.7	16	53.4
17	15	50	8	26.6
18	4	13.3	6	20
Mean ± SE	17.00 ± 1.00		17.00 ± 1.00	
Father's Occupation				
Business	4	13.3	10	33.3
Service	15	60	18	60
Expired	11	36.7	82	6.7
Mother's Occupation				
Service	24	80	15	50
Self employment	6	20	15	50
Total Income(Rs./Month)				
<20,000	22	73.3	18	60
20,000 to 40,000	5	16.7	2	6.7
>40,000	3	10	10	33.3
Mean ±SE	17220 ± 14273.71		28448.28 ± 31690	
Per capita income (Rs./Month)				
<10,000	28	93.3	24	80
10,000 to 20,000	1	3.4	3	10
>20,000	1	3.4	3	10
Mean ±SE	4432.2 ± 3309.46		7347.73± 9068.23	
Skipped Meals				
Breakfast	15	50	6	20
Lunch	10	33.3	10	33.3
Dinner	0	0	2	6.7
No	5	16.7	12	40
How Often				
Once a day	15	50	11	36.7
Once a week	4	13.3	3	10
Twice a week	2	6.7	3	10
>twice a week	4	13.3	1	3.4
Reason for Skipping Meals				
Lack of time	14	46.7	6	20
Lack of appetite	9	30	8	26.7
Do not find it tasty	2	6.7	4	13.3
Consumption of Junk Foods				
Yes	28	93.3	28	93.3
No	2	6.7	2	6.7
How Often				
Daily	1	3.4	1	3.4
Weekly	16	53.3	7	23.3
Twice a week	4	13.3	8	26.7
Thrice a week	6	20	10	33.3
Fortnightly	1	3.4	2	6.7
Pocket Money				
Yes	26	86.7	28	93.3
No	4	13.3	2	6.7

50 per cent of mothers were involved in self - employment like boutique, beautician, tutor, packing of tiffin system etc. The mean monthly income was Rs. 17220±14273.71 and Rs. 28448.28±31690 and per capita income in both the groups was Rs. 4432.2±3309.46 and Rs.7347.73±9068.23 in both the groups respectively. It was observed that 50 per cent of subjects skipped breakfast daily due to lack of time in group E, while in group C, 33.3 per cent skipped lunch daily due to lack of appetite. Further, 33.3 per cent too skipped lunch in group E and 20 and 6.7 per cent skipped breakfast and dinner in group C respectively. However, after nutrition

counseling, more number of the subjects in group E started taking regular meals at proper time, instead of eating junk foods. It was also seen that majority of the subjects (86.7 and 93.3 per cent) spent their monthly pocket money on junk foods in group E and C respectively. Further, 53.3 and 23.3 per cent consumed junk foods once a week and 20 and 33.3 per cent thrice a week in both the groups. It was observed that after nutrition counseling, the subjects preferred low fat and highly nutritious fiber rich foods.

Junk Food Consumption Pattern

Consumption of various junk foods among adolescent girls before and after nutrition counseling is given in Table 2. The most common Chinese food items were noodles (60 and 50 per cent), and maggi (13.3 and 43.4 per cent) in both the groups respectively. Table 2 depicted that 100 and 100 per cent, 100and 100 per cent, 100 and 73.4 per cent, 80 and 90 per cent, 63.4 and 73.4 per cent, 66.7 and 80 per cent and 43.4 and 40 per cent of subjects consumed fried foods like *potato chips*, *kurkure*, *kulche/bhatura channe*, *paneer pakora, bread pakora*, *cutlets* and *samosa* in group E and C before nutrition counseling respectively. It was observed that frequency of consumption of junk foods decreased after nutrition counseling in group E, as they were motivated to decrease the consumption of high fat foods, market foods, ready to eat

Table 2: Consumption pattern of Junk foods before and after nutrition counseling

Food items	Group E(n=30)				Group C(n=30)			
	Before		*After*		*Before*		*After*	
Chinese Food								
Noodles[*]	18	(60)	9	(30)	15	(50)	15	(50)
Manchurian[*]	16	(53.3)	8	(26.7)	12	(40)	12	(40)
Spring rolls[*]	11	(36.7)	6	(20)	8	(26.7)	8	(26.7)
Chopsuey[*]	5	(16.7)	2	(6.7)	1	(3.4)	1	(3.4)
Maggi[*]	4	(13.3)	2	(6.7)	13	(43.4)	13	(43.4)
Italian Food								
Macroni	18	(60)	10	(33.4)	22	(73.4)	22	(73.4)
Pasta	12	(40)	8	(26.7)	12	(40)	12	(40)
Fried Food								
Potato chips[*]	30	(100)	25	(83.3)	30	(100)	30	(100)
Kurkure[*]	30	(100)	25	(83.3)	30	(100)	30	(100)
Kulcha channa[*]	30	(100)	23	(76.7)	22	(73.4)	22	(73.4)
Paneer pakora[*]	24	(80)	18	(60)	27	(90)	27	(90)
Bread pakora[*]	19	(63.4)	8	(26.7)	22	(73.4)	22	(73.4)
Cutlets[*]	20	(66.7)	13	(43.4)	24	(80)	24	(80)
Tikki[*]	13	(43.4)	4	(13.3)	16	(53.3)	16	(53.3)
Samosa[*]	13	(43.4)	5	(16.7)	12	(40)	12	(40)
Pao – bhaji[*]	11	(36.7)	8	(26.7)	8	(26.7)	8	(26.7)
Kachori[*]	8	(26.7)	2	(6.7)	4	(13.3)	4	(13.3)
Burger[*]	8	(26.7)	5	(16.7)	11	(36.7)	11	(36.7)
Bakery Items								
Bread[*]	14	(46.7)	8	(26.7)	5	(16.7)	5	(16.7)
Cakes[*]	10	(33.4)	3	(10)	10	(33.4)	10	(33.4)
Patties[*]	9	(30)	5	(16.7)	5	(16.7)	5	(16.7)
Pastry[*]	7	(23.4)	4	(13.3)	7	(23.4)	7	(23.4)
Biscuits[*]	6	(20)	4	(13.3)	6	(20)	6	(20)
Pizza[*]	6	(20)	4	(13.3)	5	(16.7)	5	(16.7)
Sweet Dish								
Pinni[*]	20	(66.7)	13	(43.4)	24	(80)	24	(80)
Chocolate[*]	25	(83.3)	18	(73.4)	22	(73.4)	22	(73.4)
Gajrela[*]	20	(66.7)	13	(43.4)	24	(80)	24	(80)
Halwa[*]	15	(50)	8	(26.7)	27	(90)	27	(90)
Kheer[*]	13	(43.4)	9	(30)	12	(40)	12	(40)
Sweetmeats[*]	13	(43.4)	8	(26.7)	1	(3.4)	1	(3.4)
Pudding[*]	6	(20)	3	(10)	11	(36.7)	11	(36.7)
Ice-cream[*]	4	(13.3)	3	(10)	6	(20)	6	(20)

[*] Multiple Responses   Figures in ( ) parenthesis are percentage

foods, junk foods like pizza, burger, fried foods etc. and were taught to consume healthy junk foods like fermented foods, wheat noodles by adding lots of vegetables, sprouted pulses, grilled sandwiches filled with vegetables, vegetable *samosa*, *cutlets*, wheat and multigrain bread sandwiches and use of less oil in cooking to remain healthy and fit. However, negligible change in the food habits was found among subjects of group C. It was also observed that daily consumption of coffee was most common in 40 and 30 per cent in group E before and after nutrition counseling respectively. The subjects were taught to reduce the intake of caffeinated beverages as it directly affects the brain and also causes acidity. It was also observed that 43.3 and 36.7 per cent of subjects in group E preferred carbonated drinks and potato chips along with meals before and after nutrition counseling respectively. They were also taught to reduce the intake of carbonated drinks and chips as it would increase the risk for obesity, acidity and tooth decay. It was also observed that in the present study that 83.3 and 73.4 per cent and 13.3 and 20 per cent consumed chocolates and ice cream before nutrition counseling. It was noticed that inspite of nutrition counseling, there was no decrease in the intake of ice cream after nutrition counseling. Mahajan (2011) also observed that the frequency of consumption of fast food items like *pakora*, burger, macroni, manchurian, maggi, noodles, *samosa* significantly decreased after nutrition intervention. Yadav and Singh (2010) found that liking for sweets significantly (P≤0.01) improved among obese adolescents after nutrition education in Uttarpardesh.

Percent Contribution of Junk Foods to the Total Energy

Junk foods contributed to 54 and 57 per cent and 50 and 52.20 per cent to total energy intake in group E and C before and after nutrition counseling respectively. Further, the results of the present study revealed that fat from junk foods contributed to total energy intake as 37 and 39 per cent and 33 and 38.52 per cent in both the groups before and after nutrition counseling respectively.

Chhabra (2003) reported that fried snacks, fast foods and beverages contributed 20.9 per cent of their total energy intake.

Impact of Nutrition Counseling on Knowledge, Attitudes and Practices of the Subjects (KAP)

It was observed that majority of the subjects, that is, 50 per cent obtained knowledge scores between 11-15, followed by 26.7 per cent who obtained between 16-20, 20 per cent between 6-10 and only 3.4 per cent ≤5 before (pretest) nutrition counseling in group E respectively. The corresponding values being 0, 3.4, 23.3 and 73.3 per cent after (post-test) nutrition counseling respectively. However, negligible change was observed in group C, the corresponding values being 16.7, 26.7, 43.3, 13.3 per cent and 13.3, 30, 43.3, 13.3 per cent respectively before and after nutrition counseling.

Regarding the Attitude scores, it was observed that 23.3, 40, 26.7, 10 per cent of subjects obtained scores between the range of ≤4, 5-7, 8-10 and 11-13 in group E before (pre-test) nutrition counseling respectively. The corresponding values being 0, 0, 16.7, 83.3 per cent after (post-test) nutrition counseling respectively, while in group C, the corresponding values remained the same. The present study indicated that 26.7 and 0.0 per cent, 13.3 and 0.0 per cent, 16.7 and 30 per cent, 33.3 and 53.3 per cent, 6.7 and 16.7 per cent of subjects obtained scores between the range of ≤2, 3-4, 5-6, 7-8 and 9-10 in group E respectively before and after nutrition counseling, whereas, group C secured poor scores regarding Practices and the corresponding values being 23.3, 26.7, 23.3, 23.3, 6.7 per cent respectively.

Table 3 depicted that the mean Knowledge scores of pre and post nutrition counseling were 12.5±3.62 and 10.6±3.51 and 17.00±2.52 and 10.6±3.51 in group E and C respectively. Regarding the Attitude scores, mean scores of pre and post nutrition counseling were 7.00±2.55 and 6.43±3.00 and 11.63±1.13 and 8.03±1.40 in group E and C respectively. The mean Practices scores were 5.10±2.62 and 4.76±2.31 and 8.23±2.00 and 5.10±2.62 in group E and C before and after nutrition counseling respectively. It was also observed that the gain in Knowledge, Attitude and Practices scores was 4.5, 4.63 and 2.93 times in group E. Whereas the corresponding values in group C was 0.03, 1.8 and 0.34 times only. Further, the quantum of improvement was 1.36, 1.66 and 1.57 times in group E, while in group C, the corresponding value being 1.00, 1.30 and 1.10 times.

Table 3: Gain in KAP scores obtained by subjects before and after nutrition counseling

Parameters	Group E (n=30)					Group C (n=30)				
	Pre test	Post test	t-value	Gain in scores	Quantum of improvement	Pre test	Post test	t-value	Gain in scores	Quantum of improvement
Knowledge	12.5±3.62	17.00±2.52	11.910*	4.5	1.36	10.6±3.51	10.63±3.45	0.163[NS]	0.03	1.00
Attitude	7.00±2.55	11.63±1.13	13.079*	4.63	1.66	6.43±3.00	8.23±2.00	-	1.8	1.30
Practice	5.10±2.62	8.03±1.40	6.828*	2.93	1.57	4.76±2.31	5.10±2.62	0.364[NS]	0.34	1.10
Overall Mean ± SD	25.00±8.77	36.24±7.30	-	11.24	1.45	21.80±8.72	22.13±8.98	-	1.05	1.04

Table 4: Distribution of KAP scores obtained by the subjects before and after nutrition counseling

Scores	Group E (n=30)				Group C (n=30)			
	Frequency		Percentage		Frequency		Percentage	
	Before	After	Before	After	Before	After	Before	After
Knowledge								
≤5	1	0	3.4	0	5	4	16.7	13.3
6-10	6	1	20	3.4	8	9	26.7	30
11-15	15	7	50	23.3	13	13	43.3	43.3
16-20	8	22	26.7	73.3	4	4	13.3	13.3
Attitude								
≤4	7	0	23.3	0	9	9	30	30
5-7	12	0	40	0	10	10	33.3	33.3
8-10	8	5	26.7	16.7	7	7	23.3	23.3
11-13	3	25	10	83.3	4	4	13.3	13.3
Practice								
≤2	8	0	26.7	0	7	6	23.3	20
3-4	4	0	13.3	0	8	8	26.7	26.7
5-6	5	9	16.7	30	7	7	23.3	23.3
7-8	10	16	33.3	53.3	6	7	20	23.3
9-10	2	5	6.7	16.7	2	2	6.7	

A highly significant (P≤0.01) improvement in scores of group E might be due to nutrition counseling sessions, which focused on basic nutritional guidelines and strategies to modify eating patterns. Further, emphasis was given to change food habits, best food choices and identifying high carbohydrate and fatty foods. It was also discussed that there should not be more gap in between the meals but prefer frequent meals (5-6 meals) with small portion size. Food guide pyramid were also used to illustrate recommended amounts and specific consumption of food groups. Subjects were advised to increase consumption of whole cereals, multigrain and whole wheat bread, sprouted pulses, fermented products like *idli, dosa,* other vegetables, salad etc. by teaching their beneficial effects in weight reduction. Further, the increased

intake of iron and vitamin C rich foods like green leafy vegetables, fenugreek leaves, *amla*, guava, *ber* too improved the iron status among subjects. The subjects were motivated to decrease the consumption of high fat foods, market foods, ready to eat food, junk food like pizza, burger, sauces, fried food etc. The ill effects of all the foods were explained to the subjects. It was also observed that the subjects spent less time for physical exercise, more time in net surfing, computer games and were encouraged to increase their physical activities as exercise combined with diet produced greater effects. Moreover, the weight reduction produced by exercising could be easily maintained. Gupta and Kochar (2009) reported that mean scores of knowledge increased from 12.51±1.56 to 19.92±1.4 after nutrition education among adolescent girls of Ku-

rukshetra. It was also observed that gain in knowledge was 7.51 and quantum of improvement was 1.61 times after nutrition counseling which was higher as compared to present study. Rahimi et al. (2011) reported that 29, 62.2 and 8.95 per cent and 33.6, 59.3 and 7.1 per cent had good, moderate and poor nutritional attitude respectively before and after nutrition counseling.

CONCLUSION

Adequate nutritious and balanced diets along with the maintenance of health are the chief requirements in a society. The perusal of data clearly indicated that nutrition counseling had a significant and positive effect on the dietary habits, junk food consumption pattern of the subjects in Group E. Moreover, there was improvement in KAP scores of the subjects after imparting nutrition counseling.

RECOMMENDATIONS

It is recommended that junk foods could be made nutritious by adding lots of vegetables, sprouted pulses, fermented foods and sun dried green leafy vegetables. Stress on whole grain and multigrain cereal products should be given in place of processed foods and less cooking fat should be used for home made preparations. It was suggested that nutrition counseling session must be imparted to adolescent girls and their mothers for longer duration to improve the dietary habits, healthy lifestyle and to reduce the prevalence of obesity.

REFERENCES

Chhabra P 2003. *Changing Dietary Pattern and Nutritional Profile of School Girls Belonging to High School Socio-economic Group.* M.Sc. Thesis. Punjab Agricultural University, Ludhiana, India.

Chhibber C 2010. Children Hooked to Junk Food: Schools Fail to Curb the Menance. pp 1-2, *The Tribune,* Ludhiana.

Fernandez PM 2006. Dietary habits and nutritional status of school aged children in Spain. *Nutr Hosp,* 21(3): 374-378.

Gupta N, Kochar G 2009. Role of nutrition education in improving the nutritional awareness among adolescent girls. *The Internet J Nutr and Wellness,* 7(1): 491-494.

Mahajan N 2011. *Food Consumption Pattern and Nutritional Status of Urban and Rural Adolescent Boys.* M.Sc. Thesis. Punjab Agricultural University, Ludhiana, Punjab, India.

Puri S, Bhatia V, Swami H, Rai S, Mangat C 2008. Impact of diet and nutrition related education package on the awareness and practices of school children of Chandigarh. *The Internet J Epidemiology,* 6(1):32-36.

Singh P, Singh A 2008. Increasing allurensent for fast food in adolescent girls of urban area Varanasi. *Ind J Prev Soc Med,* 39 (1and 2): 24-27

Rahimi A R, Safarian A R, Modaresi Z H, Pourabdelahi P, Reza M 2011. Effect of nutrition education on nutritional knowledge, attitude and practice among female employees of Tabriz university of medical sciences. *Medical J Tabriz Uni Medical Sci,* 31(4): 12-17.

Singh S, Bansal ML, Singh TP, Kumar R 2004. *Statistical Methods for Research Workers.* New Delhi: Kalyani Publishers, P. 337.

Stang J, Story M 2005. *Guidelines for Adolescent Nutrition Services.* US department of Health and Human Services, University of Minnesota, pp. 55-57.

UNICEF 2011. Over 50 % Adolescent Girls in India. anaemic Southasia.oneworld.net/ todaysheadlines/over-50-adolescent-girls-in-india-anaemic-unicef

Yadav S, Singh A 2010. Contribution of nutritional education in dietary habits of the overweight and obese females in Hathrar city (U.P.). *Pak J Nutr,* 9(11): 1047-1051.