

A Study on the Association Between Body Mass Index (BMI) and Nutritional Knowledge among Adolescent Girls

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ABSTRACT In the current scenario adolescents are more attracted to eat fast food available in the market as compared to cooked food at home. Excess consumption of fast food and lack of physical exercise are responsible for different diseases like obesity, hypertension, coronary heart disease, etc. **Objectives of the Study:** To assess the Body Mass Index (BMI), food-intake practices, nutritional knowledge, and awareness about the effects of fast food on health. **Method:** An exploratory study was carried out in Government Women's College Sambalpur. **Sample of the Study:** 80 adolescent girls aged between 17-19 yrs old was randomly chosen for the study. **Tools Used for Data Collection:** Questionnaire, Observation-cum-discussion method applied to include demographic characteristics, anthropometric measurements, individual food habits, nutritional knowledge, and awareness regarding fast food consumption. **Statistical Tools:** Excel spreadsheets were used to determine arithmetic means, standard deviation, and Graph pad software, the quick calculator was used to analyzing T-test significance level. **Results and Discussion:** No significant difference was revealed between BMI and individual food habits with a p-value of 0.1. Most of the girls spend the whole day outside as they do not carry tiffin-box from home and they have easier access to outdoor fast food, the taste is a vital factor for fast-food consumption. Although the girls have clear knowledge and awareness about the effects of fast food on their health still they prefer to eat fast food rather than bringing homely-cooked food in tiffin-boxes. **Conclusion:** Despite being highly educated a significant majority of the girls didn't know about food groups, balanced diet, and nutritional guidelines. Moreover, no association between eating habits and BMI was found among the studied group. It was found to be essential to arrange a nutritional education program to increase their awareness regarding the need for healthy food and a healthy diet.

Keywords: Body Mass Index (BMI), Choice of Food, Food Consumption Pattern, Food Habits, Nutritional Knowledge, Nutrition Education

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HIGHLIGHT OF THE STUDY

Food is an essential component to the human body as it provides the vital nutrients for survival and ensures proper body-functioning and health. Food is comprised of macronutrients such as protein, carbohydrates and fats which not only provide calories to fuel the body and supply instant energy but also play a significant role in maintaining health. In addition food supplies micronutrients such as vitamins and minerals which do not provide calories but

serve a variety of critical functions to ensure optimal bodily activities. Nutrition is a major input to develop and maintain good health. Good health can be defined as physical, mental and social well-being endowed with a healthy mind, body, and spirit. Of recent, food therapy has emerged as the latest mode of treatment against multiple lifestyle diseases.

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Good nutrition contributes to good life primarily; vegetables and fruits appear as rich source of dietary fibers, vitamins, minerals, and antioxidants. Apart from fruits and vegetables, protein-rich foods such as milk, fish, eggs, meat, pulses and legumes significantly contribute to the human body by serving as building blocks of body tissues. Food provides nourishment to our body and protects us from different deficiency diseases. During ancient and medieval era, people preferred to eat traditional and homemade food. Nevertheless the recent influence of Western food and lifestyle, especially during the colonial and post-independence era and the emergence of electronic appliances like television, internet coupled with rapid development of mass-media and communication have introduced the people to the idea and subsequent consumption of “fast food”, at present fast-food has become a “fashion food” in Indian market. Changes in the dietary pattern has considerably tempted the younger generation people to consume more quantity of fast food due to its easier access, and tastiness and reduced expenses. Incomplete dietary pattern, lack of knowledge and awareness about traditional and homely prepared food and its nutritional value, ignorance about the benefits of home-made food and its positive impact on health and lifestyle. The mere thought of “time-consumption” while cooking altogether contributes to lesser preference towards to home-made food among the younger generation, especially in urban population. During adolescence, many physical and psychological changes occur in individuals; therefore, both good nutrition and balanced diet are very crucial in this period. Anemia - which occurs due to deficiency of iron - can be commonly noticed amongst adolescents in whom the blood lacks hemoglobin content. According to a national family health survey, 51% of adolescent girls were found to be anemic in Odisha, which could be attributed to improper intake of iron in the diet. Moreover, anemia has become a common nutritional disorder disease not only in India but also in a global scale, especially in under-developed countries. Adolescents generally lack knowledge and awareness about what and when to eat, which food is good for health and even hardly check the hygiene before eating food from outdoors and realize the consequences due to consumption of contaminated food only after ending up with diseases such as cholera, typhoid, jaundice, obesity, blood pressure, hypertension, diabetes, piles, etc. Today, fast food is easily accessible everywhere and queues of youngsters have become a common sight in shopping malls, college canteens, market places, bakeries and even in cycle-cart stalls.

Objectives of the Study

1. To study the Body Mass Index (BMI) of the respondents.

2. To study the food intake practices of the respondents.
3. To study the nutritional knowledge of the respondents.
4. To study the awareness about the effects of fast food on health.

METHODOLOGY

The Methodology involves finding out systematic solutions for a particular research problem. It may be understood as a successful scientific study of carrying out a research work. Here, we study the various steps generally adopted by a researcher to study his research problem along with the logic behind the problem. The study was conducted after obtaining the permission of the college principal. To carry out the study, 80 girls were randomly selected and tested for sampling analysis.

Geographical Area of the Study

The study was carried out in women's college Sambalpur, which is situated in the Sambalpur district of Odisha. Sambalpur is located in the western part of Odisha. As per the 2011 census; the total population of the district is 1,041,099. It is one of the oldest colleges in Sambalpur. The total strength of the college students is more than 2 thousand. Out of this, 80 girls aged between 17-19 yrs were randomly selected and tested for sampling analysis.

Collection of Data

To carry out data collection, 80 college-going girls were randomly selected. The data were collected through questionnaire regarding their demographic traits, anthropometric measurements, eating habits, nutritional knowledge and awareness related to fast food consumption. The heights and weights of the girls were measured for analysis of BMI. The BMI was calculated using the following equation.

$$BMI = \frac{\text{Weight (in kilograms)}}{\text{Height (in mtr}^2\text{)}}$$

BMI (Body Mass Index)	Weight Status
Below 18.5	Underweight
18.5-24.9	Normal
25.0-29.9	Overweight
30.0 and Above	Obese

A questionnaire regarding the choice and preference of food nutritional knowledge and awareness related to fast food was distributed among the girls and the responses were collected.

Tools and Techniques Used

Window 7.10 Excel spreadsheets commonly used for data analysis, frequency, percentage, arithmetic mean and standard deviation were used to describe the subjects and characteristics including demographic data, eating habits, nutritional knowledge and awareness among them. Graph pad software quick calculators were used for calculation of t-test and to examine the relationship between BMI and pattern of eating habits.

RESULTS AND DISCUSSION

It has been observed that 60% of girls regularly consume fast food from college canteen, marketplace, roadside stall, and shopping malls. Whereas 40% of adolescent girls sometimes consuming fast food. For the regular consumption of fast food, the taste is the major factor, as well as fast food, is easily available everywhere, within rupees of 10/20/30. Therefore adolescent girls mainly prefer to eat fast food on daily basis.

Status of BMI according to food habits is depicted in the Figure 2. It is found that 15% of girls from underweight group followed healthy eating habits and 13.7% of girls followed unhealthy eating habits. Under the normal BMI group – 16.25% of girls pursued healthy eating habits and 8.7% of the girls still pursued unhealthy eating pattern. This data could be attributed to college students spending most

of their time attending classes in colleges/coaching centers or in front of computers/lap tops. To cope up with the prolonged class hours and subsequent academic pressures and workload coupled with lesser time for lunch break, they prefer to eat fast food and totally ignore homely food. Moreover students believed that fast food is cost-effective and rapidly accessible compared to preparing a healthy meal at home “which takes more time to be prepared”. Among obese group-1, only 1.25% of the girls followed healthy eating habits, whereas 6.2% of them maintained neutral eating habits.

From the T-Test - 0.0000, the two-tailed p-value is 1.0000, with degree of freedom=6, the result is not significant at $p < 0.01$. It was found out that after adequate counseling about the importance of nutrition, balanced food; healthy food improvement in knowledge and attitude of most of the respondents. Increase in height, and weight as well as changes in external appearance and body contour usually occur during adolescence. Therefore, inadequate level of nutrients in the diet could eventually lead to deficiency diseases, thereby hampering the growth and development in individuals.

The overall study found that nearly 60% of college girls consume fast food daily and the remaining 40% of girls eat occasionally in a week. It was found that most adolescent girls are least bothered about their health as well as diet and

Figure 1: Distribution of the Respondents According to Consumption of Fast Food

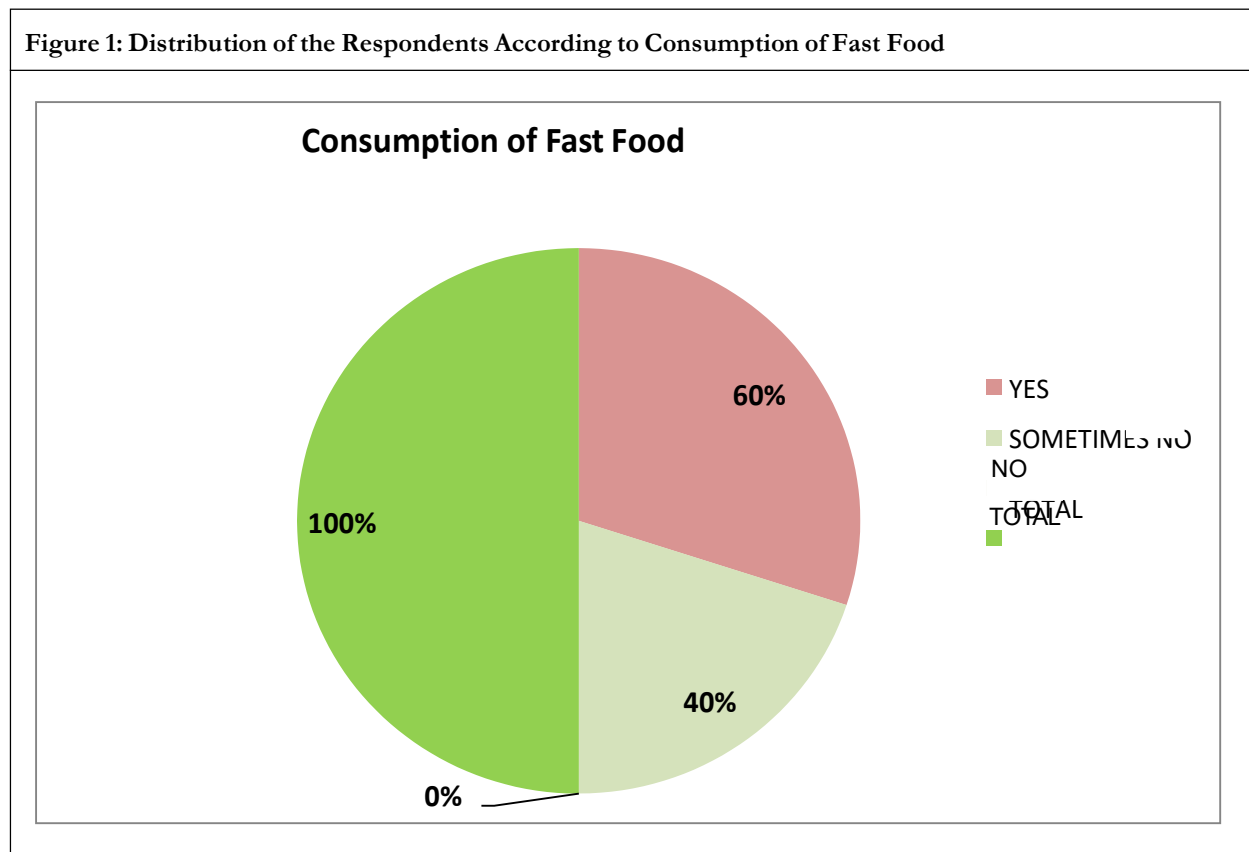
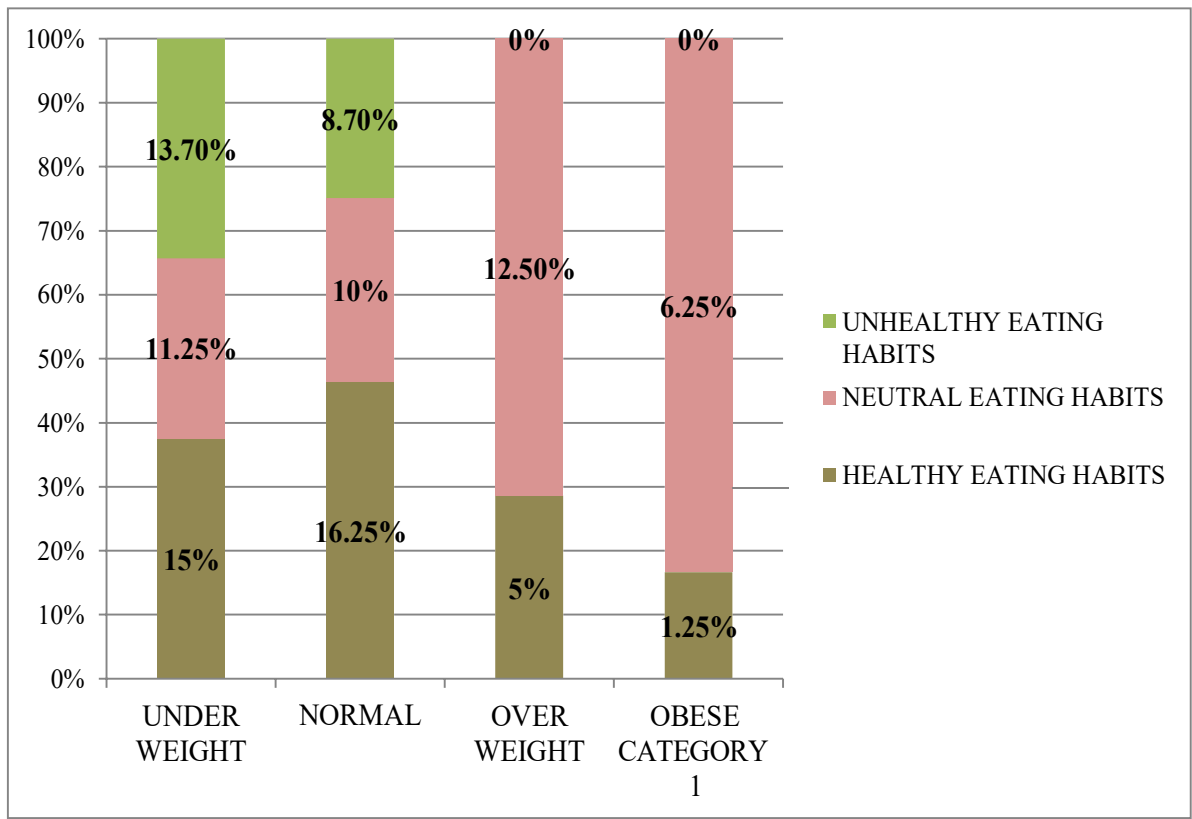


Figure 2: Status of Body Mass Index (BMI) According to Food Habits



easily eat fast food from the college canteen and outdoor eateries. Anthropometric measurement data revealed that 40% of girls were of normal weight, 35% underweight and 17.5% overweight and rest 7.5% of girls obese category 1 (Table 2).

Figure 3 revealed the food intake pattern in which the majority of the girls preferred to eat fast food followed by fried food and the remaining girls liked to eat chat and bakery food. Continuous intake of junk food adversely affects adolescent health as it contains lots of sugar, calories, and fat.

Addiction to intake of fast food leads to weight gain, obesity and consequently leads to medical issues like diabetes, cancer and arthritis in later stages of life.

Figure 4 showed that adolescent girls preferred to eat colorful and delicious food which comprised of extra amount of sauce, oil, color and Chinese salt, but medical evidence revealed that more intake of artificial food color in diet is

harmful for our body. Extreme intake of junk food containing artificial coloring agent and heavy oil content in the diet leads to obesity, hypertension, and cardiovascular disease. The Chinese salt “Ajinomoto” is a brand name of a food and biotechnology company in china which manufactures seasonings, processed and frozen food products, beverages, artificial amino acids and pharmaceuticals, which all contain the chief ingredient monosodium glutamate (MSG), a salt widely used in Chinese cuisine to enhance flavors and hence popularly called as ‘flavor enhancer’. Regular and excessive intake of Chinese salt in the diet has accounted for headache, hypertension, and cancer. In packed food such as ‘Kurkure’ and potato chips the sodium content is comparatively high as one 100 gm pack of potato chips contains 8 mg amount of sodium.

Table 3 revealed the percentage distribution regarding knowledge and awareness about fast food and nutrition

Table 1: Respondents’ BMI According to Pre and Post Test

BMI	Under Weight		Normal		Over Weight		Obese Category 1		Mean ±SD
	NO	%	NO	%	NO	%	NO	%	
Pre-test	28	0.35	32	0.4	14	0.175	6	0.075	20±12.1
Post-test	22	0.275	44	0.55	10	0.125	4	0.05	20±17.6

Table 2: Distribution of the Respondents According to BMI (N = 80)

BMI	Number of Respondents	Percentage
Underweight	28	0.35
Normal	32	0.4
Overweight	14	0.175
Obese Category 1	6	0.075

amongst adolescent girls. However, the data defined that only 58.7% of girls were aware of the effects on their health due to intake of fast food. The artificial coloring agent in the foods is deplorable for health and consequently leads to different diseases.

From the study it is revealed that 58.7 % of the participant girls were still unaware about the consumption of fast food and its effects on health even after frankly revealing that they do consume fast food as it is easily available in the market.

Figure 3: Distribution of the Respondents According to their Choice of Food

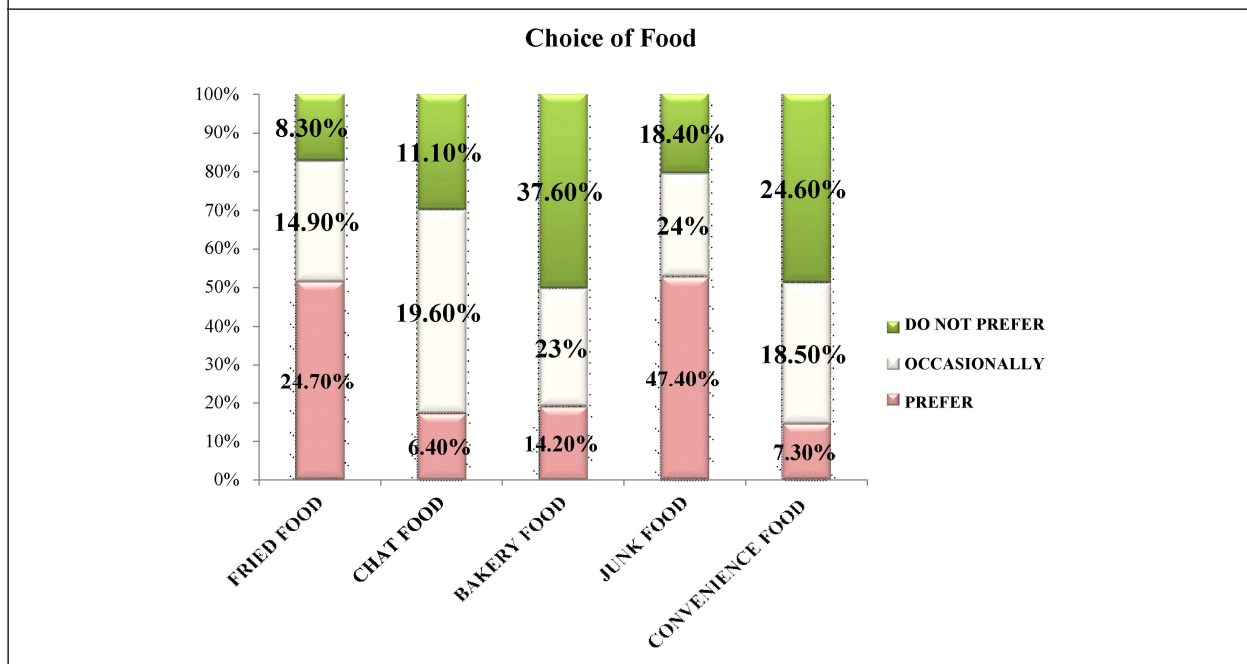


Figure 4: Distribution of Respondents According to Food Preference

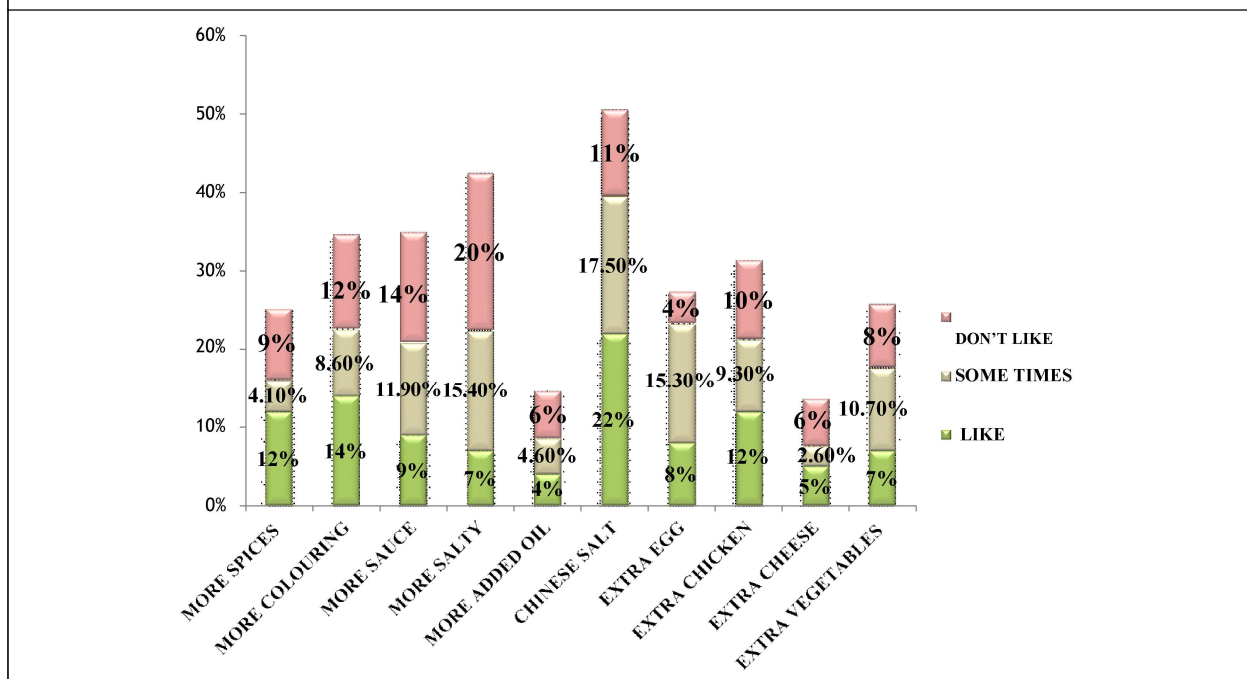


Table 3: Respondent’s Nutritional Knowledge and Awareness about the Effects of Fast Food on Health			
Knowledge About Intake of Fast Food and its Effects on Health (N = 80)			
Variables	Number	Percent	Mean±SD
Yes	47	0.587	40 ± 9.89
No	33	0.412	
Knowledge Regarding Use of Colour, Chinese Salt in Fast Food and its Effects on Health (N = 80)			
Variables	Number	Percent	Mean±SD
Yes	33	0.412	40±9.89
No	47	0.587	
Checking the Nutritional Value, Hygiene and Cleanliness before consumption of Fast Food (N = 80)			
Variables	Number	Percent	Mean±SD
Yes	17	0.2125	26.6 ±11.9
Sometimes	23	0.2875	
No	40	0.5	
Knowledge about Nutrition Value in Food and their Benefits for Health (N = 80)			
Variable	Number	Percent	Mean±SD
I Know	17	0.212	26.6 ±9.073
Some Food I Know	28	0.35	
I Don’t Know	35	0.437	
Awareness about Diseases that are Acquired due to Consumption of Fast Food (N = 80)			
Variable	Number	Percent	Mean±SD
Absolutely	27	0.337	26.6 ± 8.5
Certainly	18	0.225	
Never	35	0.437	

Currently the youngsters have plenty of options while consuming fast food such as Chowmin, Ghupchup, and Manchurian before taking outdoor food, the cleanliness of the surrounding areas, the hygiene of the food vendor, the quality of food should be properly checked.

The data showed that only 21.2% of girls regularly checked the cleanliness as well as food quality before eating fast food. Whereas 28.7% girls checked it randomly. Unfortunately the remaining 40% of respondents never checked the ingredients or about the nutritional information, manufacturing and expiry date of the food before buying them from the canteen. Such respondents who were least bothered about the food which is good or bad for their health and merrily enjoyed eating fast food should be given a brief counseling about the need for balanced diet, dietary

pattern and the extent of daily nutrition required depending on their age.

The present study still lacks specific data regarding the nutritional knowledge of adolescent girls. 30% of girls have nutritional knowledge on the effects of fast food, Chinese salt and color whereas the remaining girls were unaware.

Adolescents have to lack knowledge regarding a healthy and balanced diet. Adolescent girls don’t know about the bad effects of fast food on health, as well as girls also not know about the recommended dietary allowances and the nutritive value of food. Adolescents are not known about the disease those occur from the excess consumption of artificial color, Chinese salt, and extra oil, etc. Nutrition counseling is needed to increasing the knowledge about a balanced and healthy diet.

CONCLUSION

It is concluded from the above study fast food was easily accessible in the market and college canteen. Most of the girls preferred fast food because for the taste and cost-effectiveness. Girls spend their daily academic activities outside home due to coaching and computer classes apart from regular college classes and they hardly carry home-made food along with them. To satisfy their hunger they go to the fast-food stall to eat and hangout with friends. If the trend of consuming fast-food continues on a regular basis, it causes detrimental effects on growth and development.

It is observed that majority of the girls lacked knowledge regarding nutrition, balanced diet, dietary pattern, health and hygiene, which could adversely impact their health and pave the way for various deficiency diseases. Although, most of the girls were aware about the effects of fast food on health, and still they prefer to consume fast food, due to its taste and easy accessibility.

After counseling and discussion with girls, they realized the importance of healthy and home-made food, balanced diet, impacts of fast food on health. Therefore “Nutrition Education programmed” was beneficial to create awareness among the adolescents’ girls.

RECOMMENDATIONS

After the study, the following points were recommended to ensure good health and proper well-being of adolescent girls in the campus.

- Need to provide posters and pamphlets in the college campus.
- Need to provide counseling to the girls about the importance of proper nutrition and balanced diet for health.
- Counseling to carry home-made food in Tiffin boxes.
- To create knowledge and awareness about home-made food, health and hygiene by giving them a small lecture.
- Need to ban fast food like Ghupchup, chow mien, Manchurian and cold-drinks in the college canteen.

- Need to change the canteen menu and enhance the availability of traditional food like cereals mix, idly, vegetable upma, palak paratha, fruit juice, etc.
- To ensure gap between nutrition knowledge and awareness about food and need to provide special education on that.
- Need for strict rules and regulations about fast food sales in the college campus and nearby areas, thereby ensuring the quality of fast-foods *via* random checking in fast-food stalls with the help of food safety inspectors.

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