

## Effects of Junk Food & Beverages on Adolescent's Health – a Review Article

Geeta Arya<sup>1</sup> Sunita Mishra<sup>2</sup>

<sup>1</sup>Research Scholar, School For Home Sciences, Babasaheb Bhimrao Ambedkar University, Lucknow

<sup>2</sup>Dean & HOD, Deptt of Human Development & Family Studies, School For Home Sciences, Babasaheb Bhimrao Ambedkar University, Lucknow

---

**Abstract:** Junk foods are rich in calories, salt and fats. Excess consumption of junk foods leads rise to wide variety of health disorders. School canteens are offering foods high in fat and sugar which actually contributing to the youth weight gain along with other problems like infections, food poisonings and dental diseases. Consuming junk foods might stop the children from taking healthy meals either at school or at home. The practice of high consumption of junk foods like maggi noodles, burgers, pao-bhaji, sandwiches, hot dogs, patties, pastries, pop-corn, potato chips, carbonated drinks, biscuits, muffins, toast, kulcha-channa, samosa, chocolates etc have become common feature of adolescent's diet throughout the world.. They frequently over consume fast foods and under consume fruits, vegetables and dairy products. According to WHO, in India, more than 3 per cent of the population is in the obese category. Obesity is an emerging major public health problem throughout the world among adolescents. It is one of the most effective tool of changing the food habits without affecting their sentiments. Nutrition counseling regarding the importance of balanced diet, harmful effects of junk foods will help to curb the junk food addiction and improving their nutritional status. It should be suggested that there is a need to focus on nutrition counseling to facilitate the intake of healthy junk foods like fermented foods, wheat noodles by adding lots of vegetables, sprouted pulses, sprouted tikki, vegetable samosa & cutlets, wheat and multigrain bread..

**Keywords:** Adolescent, foods intake, effects of junk foods, weight.

---

### I. Introduction

Adolescence is the only time following 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. First, there is a greater demand for calories and nutrients due to the dramatic increase in physical growth and development over a relatively short period of time. Second, adolescence is a time of changing lifestyles and food habit--changes that affect both nutrient needs and intake.

Third, adolescent drive for individuation means more opportunity to assert food choices and expand or narrow healthy options. Adolescence can be divided into three stages. Early adolescence (11-14 years of age) is characterized by the onset of puberty and increased cognitive development. Middle adolescence (15-17 years of age) is characterized by increased independence and experimentation. Late adolescence (18-21 years of age) is a time for making important personal and occupational decisions. Poor nutrition during any of these stages can have lasting consequences on an adolescent's cognitive development, resulting in decreased learning ability, poor concentration, and impaired school performance Eating junk food has become a trend. The children hate homemade healthy food. Junk food is injurious to health. Eating Burger and Pizza increases cholesterol in human body. The fat in human body increases. The increase fat is dangerous for heart. Drinking soft drinks adds dangerous toxins in human body. It affects the bone, skin and kidney.

Good nutritious diet or balance diet is basic need of every child for their growth and development because of its delicious taste.<sup>1</sup> Most of the children of this age during their meal time eat junk food and get addicted to the taste of the junk food. Though, junk foods are tasty but it has low nutritive value and high calories. Many people try to avoid or limit junk food in their diet. Out of that such food is not healthy, despite the fact that numerous food manufacturers manufacture various ranges of products which could be considered as junk food.<sup>1</sup> It food comprises of anything that is quick, tasty, convenient and fashionable. The commonest scenario is a child who returns from school and plonks himself in front of television, accompanied by a bowl of wafers or any other junk food. Junk foods are not healthy and have various ill-effects. Because of low nutritive value and high calories, children become obese. Junk foods are also laced with colours which are often in edible, carcinogenic and harmful to the body.<sup>1</sup> These foods and their can affect digestive system, its effects can emerge after many years. Studies have found that food colouring can cause hyper activity and lapses of concentration in children. Hence children suffering from learning disabilities are advised against eating food with artificial colouring. Poor nutritional habits can undermine these pre-requisites of learning, as well as sap the strength that

children need for making friends, interacting with family, participating in sports and games. Junk foods are often eaten instead of regular food which is not good for health.



Adolescent period is characterized by heavy demands of calorie and proteins. The appetite of the child increases and he tends to consume more carbohydrate foods. Intake of vitamin C and vitamin A may be low due to improper habits of eating snacks. Many people try to avoid or limit Junk food in their diets, out of concerns that such food is not healthy despite the fact numerous food manufacturer produce a range of products which could be considered junk food. Nutritionist, doctors, and other health advocates often work to educate people about junk food, encouraging them to eat well balanced diets which contain a high proportion healthy food.

A study of the eating habits of American teenagers found a link between the length of time young people spent in front of the television and the quality of what they ate in later life. Teenagers who watch more than five hours of television a day eat more junk food in adult life than those who view less. Researchers chose just under 2,000 pupils at middle schools and high schools in America and surveyed how many hours of television they watched per day. They returned five years later, when the younger volunteers were in their late teens and the older ones were in their early 20s, and analyzed their diets. The scientists found that those who had been watching most television five years before had significantly higher intakes of fried food, sugary drinks and snacks but much lower consumption of vegetables, fruit and fibre. Average, young adults who watched more than five hours a day of television as teenagers had a 10 per cent higher calorie intake than those who had spent less than two hours a day in front of the box. Their average fast food intake was 15 per cent higher and their consumption of sugary drinks was 17 per cent higher than those who watched least television as teenagers, the study published in the International Journal of Behavioral (corr) Nutrition and Physical Activity, shows. <sup>6</sup>

Healthy nutritious foods have been replaced by the new food mantra - JUNK FOOD! Junk food comprises of anything that is quick, tasty, convenient and fashionable. It seems to have engulfed every age; every race and the newest entrants are children. Wafers, colas, pizzas and burgers are suddenly the most important thing. The commonest scenario is a child who returns from school and plunks himself in front of the television, faithfully accompanied by a bowl of wafers and a can of cola. Children suddenly seem to have stepped into a world of fast foods and vending machines, totally unaware of the havoc they are creating for themselves. For children who have less vision of the heart disease, cancer, high blood pressure or diabetes that might befall them decades later, the tentacles of a junk food environment are virtually inescapable.

Studies reveal that as early as the age of 30, arteries could beginning clogging and lay the groundwork for future heart attacks. What children eat from puberty affects their risks of prostate and breast cancer. Osteoporosis and hypertension are other diseases that appear to have their earliest roots in childhood when lifelong eating habits are being formed. Children are especially vulnerable. Poor diets can slow growth, decay new teeth, promote obesity and sow the seeds of infirmity and debilitating disease that ultimately lead to incurable disease worse make life insufferable. Junk food simply means an empty calorie food.





An empty calorie food is a high calorie or calorie rich food which lacks in nutrients such as vitamins, minerals, or amino acids, and fiber but has high energy calories). These foods do not contain the nutrients that your body needs to stay healthy. Hence, these foods that has poor nutritional value is considered unhealthy and may be called as junk food. Junk food is an informal term applied to some foods which are perceived to have little or no nutritional value, but which also have ingredients considered unhealthy when eaten regularly, or to those considered unhealthy to consume at all. The term “Junk food” was coined as a slang in the public interest in 1972 by Michael Jacobson, **Director of the Center for Science, Washington D.C.** Adolescence is a transitional period between childhood and adulthood, which begins from the earliest signs of secondary sexual characteristics development and ends when a person has achieved adult status (WHO, 1995). Hence, dramatic changes and development of the physical, emotional and cognitive functions occur during adolescence. In order to achieve optimal growth and development during adolescence, the nutritional requirements are the highest across the life span. Practicing healthy eating behavior is one of the important factors to meet the nutritional needs of adolescents. Adolescent period is characterized by heavy demands of calorie and proteins. The appetite of the child increases and he tends to consume more carbohydrate foods. Intake of vitamin C and vitamin A may be low due to improper habits of eating snacks.

### **Effect Of junk Food and Beverages**



Eating junk food causes

- Weight gain (Obesity)
- Diabetes
- Heart diseases

### **Obesity**

The effects of junk food include nutritional deficiencies, obesity, increased cholesterol levels, cardiac problems and many other threatening health hazards. Most of these quick and convenient meals contain high amount of sodium, which increases and aggravates the risks of high blood pressure. According to the recommendations of the National Research Council of the National Academy of Sciences 1,200 - 1,500 mg of sodium is the daily sodium requirement for adults. Although the body requires minimum quantities of sodium, too much sodium contributes to high blood pressure. Sodium can also lead to building-up of fluids in case of people who are suffering from people with congestive heart failure, cirrhosis, or kidney disease. Fast food is loaded with calories from refined sugar and fats (especially, the artery-clogging saturated and hydrogenated fats, which are repeatedly reheated to high temperatures for frying purposes).

Another issue in the fast food industry is the health hazards that fast food chains are prone to. A particular hazard is the E-coli bacteria that meat products are susceptible to. Because of the long supply chain through which fast food chains operate in, the handling and sourcing of the meat is very hard to monitor. Eating fast food and leading a sedentary lifestyle leads to obesity. Obesity leads to other complications like increase in

the cholesterol level, blocking of the arteries, the increased risk of coronary diseases, in addition to the general physical discomfort posed by the extra weight. Fast food is also addictive and hence it is very difficult to give up on their greasy and fatty foods and carbonated drinks and switch to healthier option. Structured teaching programme is one among the thrusts of health education. It helps the adolescents to get adequate knowledge regarding the ill or harmful effects of fast foods. If they get adequate knowledge it helps them to overcome the harmful effects in a prior stage. In turn it will help them or encourage them to seek appropriate and timely medical advice. Though many studies are conducted in the field of harmful effects of fast foods on health, the researcher could not find any valid study to assess the effectiveness of structured teaching programme on knowledge of adolescents regarding the harmful effects of fast food on health. Hence the researcher felt the need for a study to find the effectiveness of structured teaching programme on knowledge regarding the harmful effects of fast food on health among adolescents in selected PU College of Raichur.

Obesity is an emerging pandemic of the new millennium. This has profound public health consequences, as 70 percent of overweight children become overweight adults. (1) Obesity is defined as an excess of body fat as measured by Body Mass Index (BMI) ratio in adults – this is calculated by dividing weight in kilograms by height in meters squared. In adults, a BMI over 25 are classified as overweight and over 30 as obese (classes I, II or III or moderate, severe or morbidly obese).

According to Swaminathan a person whose body weight is higher than normal by 15-20 percent is considered as overweight and by 25 percent is considered as obese. Obesity has increased in both developed and developing countries although the pace and pattern differ from country to country. It has profound public health consequences, as seventy percent of the overweight children become overweight adults. Fat and sugar in combination are capable of producing a dopamine-driven surge of intense pleasure in people with a propensity for addictive behavior. On the other side, it must be noted that they are hazardous to health too. High fat content, particularly cholesterol, sugar and salts have their adverse effects on health. Soaring calorie content with sugar can lead to obesity.

In a study done in Beijing, China and published in the year 2008 revealed eating junk food is a popular event among children and adolescents between the age of 8. The results revealed that the percentage of overweight and obese children are growing in Tamil Nadu also, like in the other states of India and globally.

Obesity and overweight were seen more in girls and underweight seemed to be more in boys indicating an increasing trend in the percentage of obesity among girls compared to boys. So it was concluded that the increasing trend of the modern day epidemic of overweight and obesity in children calls for immediate action to reduce the incidence through appropriate nutrition intervention programmes involving school children, their parents and school authorities. If immediate measures are not taken the condition can lead to serious problems beyond repair. In short the study showed that life style pattern like family history, minimum physical activity, long duration of screen time, snacking during screen time, dining outside very frequently and sleep pattern of the child do contribute to childhood obesity. Dietary habits like frequent consumption of deep fat fried fleshy foods; fast food consumption and soft drinks consumption play a vital role in increasing the number of obese children. So it was concluded that the increasing trend of the modern day epidemic of overweight and obesity in children calls for immediate action to reduce the incidence through appropriate nutrition intervention programmes involving school children, their parents and school authorities. If immediate measures are not taken the condition can lead to serious problems beyond repair.

Several studies have been done in India to assess the prevalence of overweight and obesity among the adolescents. A study conducted among the affluent public school children in New Delhi, revealed prevalence of overweight and obesity of about 25 percent and 7 percent, respectively (Kapil et al 2001). Another study done in Delhi reported a combined overweight and obesity prevalence of 16.6 percent (Stigler et al 2011). Yet another study done in Delhi revealed the prevalence of overweight and obesity to be 13 and 9.3 percent respectively (Kaur et al 2008). Similarly the reported prevalence of overweight and obesity among the affluent adolescent school children in Chennai, Tamil Nadu was about 15 percent (Subramanyam et al 2003). The result of studies conducted among adolescents from Punjab, Maharashtra, Gujarat, Bangalore, Hyderabad and South India revealed that the prevalence of overweight and obesity was high ranging from 11 percent to 29 percent (Goyal et al 2010; Laxmaiah et al 2007; Aggarwal et al 2008; Khadilkar et al 2004; Bharati et al 2008). A study was conducted to assess the prevalence of obesity and overweight among adolescents in Dayanand medical college, Ludhiana, Punjab, India. Thousand samples were selected by random, purposive sampling. Data were collected by Questionnaire regarding dietary habits and life style. The results were analyzed statistically by applying students' t-test, Z-test and Chi-square ( $\chi^2$ ) test.  $P$ -value  $<0.05$  was taken as significant. Result of this study showed that there is no significant difference between boys and girls. A significantly greater number of boys (15%) as compared to girls (10.2%) were overweight. Out of the total obese children, significant percentages (82.3%) were non-vegetarian, where as only 8.8% of vegetarians and ovo-vegetarians were obese. They concluded that the incidence of obesity/overweight was found to be significantly higher in those adolescents who ate meals outside home. A study was conducted to assess the effects of fast food on energy intake in

overweight versus lean adolescents in Boston, USA. Fifty-four samples (26 overweight, 28 lean) were selected by convenient sampling method. Data were collected by telephone interviews. Result of the study showed that mean [average] energy intake from the fast food meal among all participants was extremely large (1,652 kcal =calories). Overweight participants ate more than lean participants whether energy was expressed in absolute terms (1,860 vs. 1,458 kcal) or relative to estimated daily energy requirements (66.5 percent vs. 57 percent).

They concluded that overweight participants tended to under-report total energy intake compared with lean participants.

## **II. Weight Gain**

According to the Massachusetts Medical Society Committee on Nutrition, fast food is especially high in fat content, and studies have found associations between fast food intake and increased body mass index (BMI) and weight gain. Fast food comprises a growing portion of food eaten outside the home. In 1953, fast food accounted for 4% of total sales of food outside the home; by 1997, it accounted for 34%. As a percentage of discretionary food expenditure, fast food doubled from 20% in the 1970s to 40% by 1995. Finally, as a percentage of total energy intake, fast food quintupled from 2% in the 1970s to 10% in 1995. One-third of US adults report having eaten at a fast food outlet on any given day; 7% of Americans eat at a fast food restaurant daily.

Our brain is the organ in affecting how we think and move. Fast food and junk food are very low in nutrients; instead they are full with colorings, flavors and preservatives. Researchers have shown that junk food might cause dyslexia, ADHD (attention deficit hyperactivity disorder) and worse is autism. An individual's mood and attention are highly influenced by the food taken, which means it will affect the concentration. The effects of fast food include nutritional deficiencies, obesity, increased cholesterol levels, cardiac problems and many other threatening health hazards. Most of these quick and convenient meals contain high amount of sodium, which increases and aggravates the risks of high blood pressure. According to the recommendations of the National Research Council of the National Academy of Sciences 1,200 - 1,500 mg of sodium is the daily sodium requirement for adults. Although the body requires minimum quantities of sodium, too much sodium contributes to high blood pressure. Sodium can also lead to building-up of fluids in case of people who are suffering from people with congestive heart failure, cirrhosis, or kidney disease.

A study was conducted to assess the socio-environment, personal and behavioral predictors of fast food intake among adolescents in Minnesota schools, USA. 806 samples were selected by random sampling method.

Result of this study showed that personal and behavioral factors, including concern about weight and use of healthy weight-control techniques, were protective against increased fast-food intake. Sports team participation was a strong risk factor for increased fast-food intake among males. They concluded that addressing socio-environmental factors such as acculturation and home food availability may help reduce fast-food intake among adolescents. Additionally, gender-specific intervention strategies, including working with boys' sports teams, family members and the peer group, and for girls, emphasizing the importance of healthy weight-maintenance strategies and the addition of flavorful and healthy food options to their diet, may help reduce fast-food intake.<sup>13</sup>

## **III. Diabetes**

Dense sugar content can cause dental cavities and type 2 diabetes mellitus. A short-term adverse effect as a result of eating junk foods, lack of energy which occurs because junk foods don't provide essential nutrients, even though they can be very much sufficing, due to which one feels weakened. Unfortunately, Meals consisting of junk food don't fill up for long. Because they are lacking in fibre, and are made of processed foods, they are rated high on the glycaemic index, which means they provide a quick rise in blood sugar, but this also falls quickly, and giving rise to hunger.. The high levels of sugar in junk food which puts metabolism under stress; when refined sugar is taken, the pancreas secretes high amounts of insulin to prevent a dangerous spike in blood sugar levels. Because fast food and junk food don't contain adequate amounts of protein and good carbohydrates, the blood sugar levels suddenly drops after eating, resulting with grumpy, fatigued feeling and a craving for sugar. Another pathway which acetyl CoA is involved is in formation of ketone bodies, which is inactive when energy levels are high, but is active in case when impaired glucose tolerance sets in. Carbonated soft drinks, in addition to towering amount of sugar reportedly contain methylglyoxal (MG), which is strongly associated with human carbonyl stress. Fried and processed food, contains high amounts of trans fats, saturated fats in addition to ox cholesterol. Ox cholesterol is a little-known type of cholesterol which may prove to be a lethal compound to heart health as reported by Scientists from China in the National Meeting of the American Chemical Society in August 2009.

### **Heart Disease**

Fast foods have high level of fat and sugars that are not only unhealthy but addictive and that creates a vicious cycle making it hard for children to choose healthy food. High content of trans fat in commercially available fast foods predispose children to risk of future heart diseases. Energy Density of fast food is more than twice the recommended daily allowance for child taken measure to liberalize the international trade to reduce the cost of food grains. However, trade liberalization has led to massive infiltration of Indian market with fast food joints. Imposing heavy tax on imported and manufactured readymade food items might control this encroachment.en]. Fast food intake leads to higher proportion of calories being derived from total and saturated fat .moreover, the micronutrient content (carotene, vitamin A, vitamin C) of the fast food is also low levels of calcium and magnesium in the taken measure to liberalize the international trade to reduce the cost of food grains. However, trade liberalization has led to massive infiltration of Indian market with fast food joints.

Imposing heavy tax on imported and manufactured readymade food items might control this encroachment

### **High Blood Pressure**

High sodium level has been clearly implicated as the causative factor for high blood pressure. Sodium is known to affect renin-angiotensin system in kidneys, which produces vasoconstrictive effects on arterioles, leading to development of high blood pressure. Also the salts used for the preparation has an impact of their excretion through kidneys, thus having an effect on renal system. High cholesterol from junk food also affects liver on the long run where it is metabolized as its trains liver, damaging it eventually.. Cholesterol and salt are known to set off blood pressure, stroke and heart diseases in a chain. Excessive salts can affect functioning of kidneys too. Excess fats and oils along with spices added in these foods act as an irritant to gastric mucosa leading to excess secretion of hydrochloric acid, landing in gastritis. Poor concentration is another result of junk food habit known to affect in immediate and medium term periods. When a sumptuous junk meal rich in oil is taken, there is a feeling of drowsiness and failure to concentrate. The junk food eating over a sustainable period of time can drop blood circulation due to fat accumulation. Lack of vital oxygen, nutrients and proteins particularly can stale the grey (brain) cells temporarily. Most of the times these junk foods contain colours, which are often inedible, carcinogenic and harmful to the body. Flavourings and colourings can be allergic causing asthma, rashes and hyperactivity. Animal studies on rats have demonstrated the ill effects of consuming junk foods during pregnancy which affects the health of foetus.

## **IV. Conclusion**

About one fourth of the adolescents skipped breakfast on at least one day during the school week. A greater proportion of adolescents studying in the private schools skipped breakfast than those studying in government schools. It most probably has to do with the early school timings of the private schools. Moreover students from private schools have to board their school buses at least an hour before the school starts. The percentage of adolescents who skipped breakfast (23.3%) in this study is in concordance to the studies done in the United States (Story et al 2002). Only 27.1 per cent of the adolescents always brought lunch to school. In fact none of the participants from the government schools ever brought lunch to school. As a result 84.5 per cent of the adolescents from government schools consume junk food which could be cheap and easily available near the school premises. The study findings show that 41.4 per cent of the adolescents do not have dinner with parents and 21.2 per cent adolescents have dinner while watching television. Mass media had been found to be an influential factor affecting the food choices of children (Story et al 2002). The study found that 45.7 per cent of the adolescents go out for dinner at least once a week. In fact eating out is strongly associated with junk food consumption ( $p = 0.001$ ). Adolescents who go out for dinner have a two times higher chance of consuming junk food as compared to those who never dined out. Also adolescents who consume moderate amounts of vegetables and fruits daily were less likely to eat junk food compared to those who took low amounts of vegetables and fruits. These factors found to be significantly associated with junk food consumption had also been confirmed in other studies (Story et al 2002; Neumark et al 2003). Parental modelling of eating was found to be a significant factor associated with vegetable and fruit consumption. This has also been revealed in studies done in various European countries (Baronowski, 1997). The present study tries to understand some of the environmental and personal factors influencing adolescents' eating behaviour and food choices. Conclusions of this study are that early school timings act as a barrier to having regular breakfast that results in skipping of breakfast by the adolescents; vast majority of the adolescents consume junk foods of some kind or the other on a daily basis, government school adolescents consume more unhealthy junk items; majority of the adolescents feel that the benefits of eating more vegetables and fruits were not taught at school; place of lunch, family meal (dinner), eating dinner out and moderate consumption of vegetables and fruits are important factors influencing junk food consumption by adolescents; and last but certainly not the least, better economic status, bringing lunch to school, family meal (dinner), parental modelling of eating, availability and accessibility contribute to moderate

consumption of vegetables and fruits by adolescents. Arguably what we have seen from this study may be just the tip of the ice-berg. It is likely that a greater proportion of adolescents consume junk food and even a lesser proportion eats moderate amounts of vegetables and fruits.

### Reference

- [1]. A.B Harriss and G.V.Robbins, "Nutrition in catering"; William hinmanpublishers, London, page no; 173-175
- [2]. Aggarwal T "prevalence of obesity and over weight in adolescents" from Ludhiana Punjab July 18 2007 journal of Indian paediatrics; 45:500-502
- [3]. Asgary S, Nazari B, Sarrafzadegan N, Parkhideh S, Saberi S, Esmailzadeh A, et al. Evaluation of fatty acid content of some Iranian fast foods with emphasis on trans fatty acids. *Asia Pac J Clin Nutr*. 2009;18:187-92.
- [4]. Bandini LG, Vu D, Must A, Cyr H, Goldberg A, Dietz WH. Comparison of high-calorie, low-nutrient-dense food consumption among obese and non-obese adolescents. *Obese Res* 1999;7:438-43.
- [5]. Baronowski T. Families and health action. Handbook of health behaviour research, personal and social determinants. Plenum press, New York 1997; 179-205.
- [6]. Bayol SA, Macharia R, Farrington SJ, Simbi BH, Stickland NC. Evidence that a maternal junk food diet during pregnancy and lactation can reduce muscle force in offspring. *Eur J Nutr* 2009; 48: 62-5
- [7]. Brendan O'Neill. Is this what you call junk food? [Internet] 2006 [Last Updated: Thursday, 30 November 2006, 18:48 GMT] Available from: [://news.bbc.co.uk/2/hi/uk\\_news/magazine/6187234.stm](http://news.bbc.co.uk/2/hi/uk_news/magazine/6187234.stm)
- [8]. Charles's "Adolescents over eat fast food ,but lean adolescents overconsumption eating less "Journal of American medical association 2004 ,20:47
- [9]. Children and junk food <http://www.indiaparenting.com/food-and-Nutrition/561186/children-and-junk-food.html>
- [10]. Dorothy Jaganathan<sup>1</sup>, Meera Mary Mathew<sup>2\*</sup> <sup>1</sup>Professor; Department of Food Service Management and Dietetics Avinashilingam Institute for Home Science and Higher Education for Women, Coimbatore 641 043, <sup>2</sup>Ph.D Research Scholar, Department of Food Service Management and Dietetics Avinashilingam Institute for Home Science and Higher Education for Women, Coimbatore \*
- [11]. Gomathy R and John S (2008) Measuring psychosocial, environmental and behavioural factors that influence the fruit and vegetable intake of adolescent girls. *J Ind Dietet Assoc* **33(2)**:26-37.
- [12]. Goyal RK, Shah VN, Saboo BD, Phatak SR, Shah NN, Gohel MC, Raval PB, Patel SS. Prevalence of overweight and obesity in Indian adolescent schoolgoing children: its relationship with socioeconomic status and associated lifestyle factors. *J Assoc Physicians India*. 2010;**58**:151-8
- [13]. Hovenkamp E, Demonty I, Plat J, Lütjohann D, Mensink RP, Trautwein EA. Biological effects of oxidized phytosterols: a review of the current knowledge. *Prog Lipid Res* 2008; 47:37-49.
- [14]. Jelliffe D B (1966) The Assessment of Nutrition of the Community. World health Organisation Monograph series No. 53, Geneva: 50-84.
- [15]. John Bingham, "Teenagers who watch the most television 'eat more junk food than adults" published: 30 Jan 2009.
- [16]. Journal of Food and Nutrition, "Poor Eating Habits article on Children and Junk Food", 2008
- [17]. Kathrine.W.Bauer, "socio environmental personal and behavioral predictors of fast food intake among adolescents"
- [18]. Khadilkar VV, Khadilkar AV. Prevalence of obesity in affluent school boys in pune. *Indian Pediatr* 2004;41:857-8.
- [19]. Laxmaiah A, Nagalla B, Vijayaraghavan K, Nair M. Factors affecting prevalence of overweight among 12- to 17-year-old urban adolescents in Hyderabad, India. *Obesity (Silver Spring)*. 2007 ;15(6):1384-90.
- [20]. Monga S, Sachdeva R and Chawla P (2008) Nutritional and Health status of urban working women as influenced by nutrition counseling. *J Ind Dietet Assoc* **33(2)**:13-20.
- [21]. Nakayama K, Nakayama M, Terawaki H, Murata Y, Sato T, Kohno M, Ito SJ. Carbonated soft drinks and carbonyl stress burden. *Toxicol Sci* 2009; 34:699-702.
- [22]. Neumark-Sztainer D, Hannan PJ, Story M, Croll J & Perry C. Family meal patterns: associations with sociodemographic characteristics and improved dietary intake among adolescents. *J Am Diet Assoc* 2003; **103**: 317-22.
- [23]. Pathak S (2010) To Assess the incidence of overweight and obesity in school going children (13- 15 years) and its relationship with mothers nutritional knowledge, attitude and practice. M.Sc. Thesis. Government Home Science College, Chandigarh, India.
- [24]. Printice AM, Jebb SA. Fast foods, energy density and obesity: a possible mechanistic link. *Obesity Rev*. 2003;4:187-94
- [25]. Sanjeev, N.E., and Sobal. E., Theodore. C., Predictors of weight gain in the Pound of Prevention study, *Int J Obes*, 2009; 24: 395-403
- [26]. Schmidt M, Affenito SG, Streigl-Moore R, Khoury PR, Barton B, Crawford P, et al. Fast food intake and diet
- [27]. Shubhangini.A.Joshy, "Nutrition and diabetes" first edition published by Tata Mcgraw-Hill publishing company limited page 183 55.
- [28]. Singh K P (2010) Fighting obesity: Need to spread awareness. pp 12, The Tribune, Ludhiana.
- [29]. Some bad effects of junk food. [Internet] 2009 Feb 20. Available from: [http://www.articlealley.com/article\\_792389\\_23.html](http://www.articlealley.com/article_792389_23.html)
- [30]. Subramanyam V, Jayasree R, Mohamad Rafi. Prevalence of overweight and obesity in Affluent girls in Chennai 1981 and 1998, *Indian Pediatrics* 2003;40(4):332-6
- [31]. Swaminathan, M. Principles of Nutrition and Dietetics. Second Edition, Bapco Publishing, Bangalore, 2005. p.528.
- [32]. Weight Carol west. Suiter and Merely Forbes "Nutrition –Principles And Application in Health promotion" second edition 1984 page no;293
- [33]. Weight Carol west. Suiter and Merely Forbes "Nutrition –Principles And Application in Health promotion" second edition 1984 page no;293
- [34]. WHO (2005) Global database on BMI: BMI classification. An interactive surveillance tool for monitoring nutrition transition. Pp. 4. World Health Organisation, Geneva.
- [35]. Zhu SP, Ding YJ, Lu XF, Wang HW, Yang M, Wang JX, Chao XD, Zhao Z. Study on factors related to top 10 junk food consumption at 8 to 16 years of age, in Haidian District of Beijing. *Zhonghua Liu Xing Bing Xue Za Zhi* 2008; 29:757-62.