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Dietary Patterns of Adolescent Girls in Urban Hyderabad, India - A Cross-Sectional Study

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Abstract: *The period of transition from childhood to adulthood is called adolescence. They attain adult stature between 18-20 yrs. Diet plays an important role in growth and development of adolescents. With the profound growth there is an increased demand for energy, proteins, minerals and vitamins. Apart from the needed requirements this age group is more vulnerable to either over nutrition or under nutrition due to their faulty eating pattern. Nutritional problems commonly observed in this age group are obesity, anorexia, anaemia, binge eating and premenstrual syndrome. The present study assessed the dietary pattern, food preference, food habits, lifestyle and physical activity of urban adolescent girls in between age group of 18-21yrs. A questionnaire survey was carried out using a close ended question. The study sample consisted of 360 under graduate students. The investigation carried out showed that 52% of adolescents had their breakfast on regular basis out of which 67% included carbohydrate rich foods in their breakfast, about 69% of adolescents had their snacks in the evening time, 47% adolescent were seen to eat out on regular basis, 27% were seen to prefer homemade food, 39% were seen to eat deep fried foods and 46% of adolescents were reported of never doing any kind of physical activity. These adolescents were seen to be suffering from various macro mineral deficiencies as 36% reported of iron deficiency and 17% reported of vitamin deficiencies and when looked into their weight management 54% of adolescent have shown not maintaining their ideal body weight.*

Key words: *Adolescent girls, diet, anemia, breakfast, premenstrual syndrome*

Objective: *Amid concerns about the quality of young people's diets, this survey was conducted to assess the eating habits and dietary pattern for identifying risky behaviour as well as for ensuring their full growth and development potential.*

Methods: *The sample population of 360 was chosen from the students in the college. All the participants were in the age group of 18-21years and questionnaires were distributed and data was collected during 2015-16. A questionnaire was prepared, pretested and administered to the students who were randomly chosen.*

Results: *The eating habits were found to be unsatisfactory. Meals consumed lacked fruits and vegetables on daily basis. Skipping of breakfast was seen in 50% of the adolescents. Consumption of refined nutrient lacking snacks was the major concern.*

Lack of exercise, only 14% reported of exercising daily and weight tracking was seen.

Conclusion: *The adolescents presented the above stated various negative habits that required to be changed through awareness and proper information of food guidelines.*

I. INTRODUCTION

The word adolescence is derived from the Latin word "adolescence" which means "grow to maturity". Adolescence is a period which falls between adulthood and childhood. It is an age of transition wherein an individual experiences growth and development, where physical and psychological changes take place leading to adulthood. During adolescence various changes occur in reproductive system, sexual maturation takes place, formation of identity and gender roles set in. Adolescents are a nutritionally vulnerable age group, considering their increased nutritional needs, eating patterns, life style, and susceptibility to environmental influences. Healthy habits have to be formulated for the rapid growth in adolescent period which is linked with increased nutritional needs. Adolescents are known to have the most erratic food habits. Variation in young people's dietary intake is likely to reflect foods available and the values and circumstances of parents, school and peers, as much as the adolescents' own motivations. Nonetheless, there are many opportunities for young people to make personal food choices, which make it important to examine the more voluntary aspects of healthy eating. Most adolescents are economically active, at least to the extent of having the resources to buy snacks, and they consume snack foods more frequently than adults. Some adolescents will be involved in the purchase and preparation of food at home, and many will choose their own meals at school. Adolescents can also refuse food offered to them. Looking at patterns of eating behaviour in situations in which young people are likely to be able to make personal choices may provide a useful complement to assessing dietary intake. Most of them skip their breakfast, they do not maintain regular meal

timings and they show great preference for junk foods. Consumption of food high in sugar, saturated fat and calorie content during adolescence can lead to early development of obesity, hypertension, and dyslipidemia and impaired Glucose tolerance in adulthood. Taking that factor inconsideration, a survey has been conducted to study the dietary pattern of college going girls.

II. MATERIALS AND METHODS

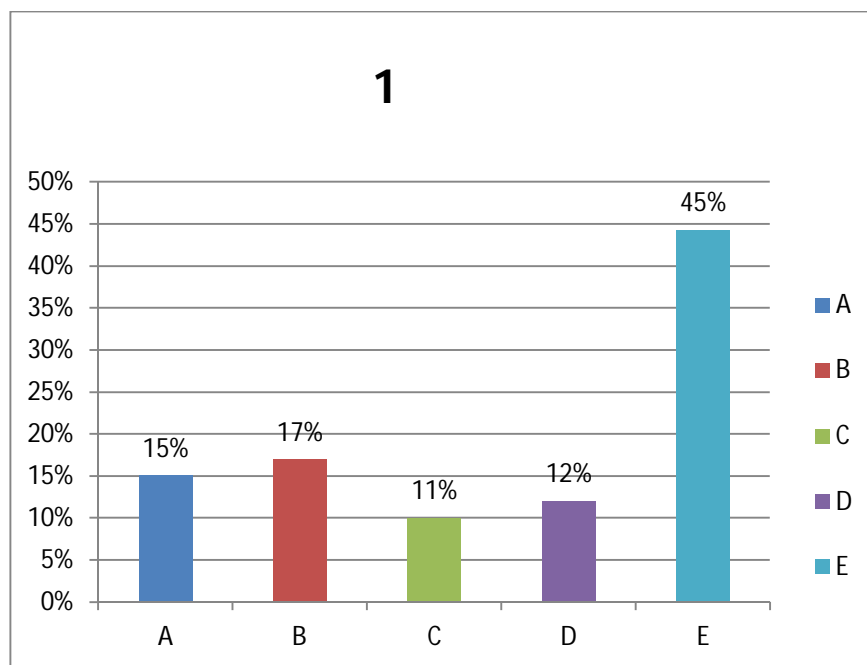
The present survey was conducted in St.anns College for women, Mehdipatnam, Hyderabad. The present study assessed the dietary pattern, food preference, food habits, lifestyle and physical activity of urban adolescent girls. The sample population was chosen from the students in the college. All the participants were in the age group of 18-21years and pretested questionnaires were distributed and data was collected during 2015-16. A questionnaire was prepared and counted manually based on the options for each question framed.

III. RESULTS AND DISCUSSIONS

The following contains the result and discussion of a series of questions from the survey.

A. Do you have a drink from any of the following (beverage) early morning?

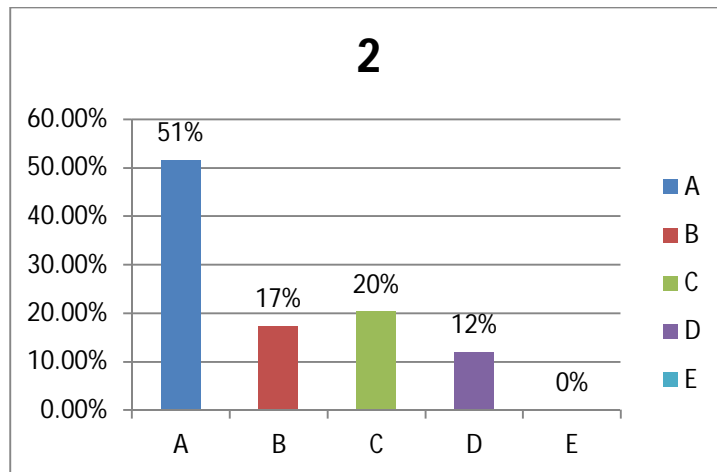
- 1) A glass of water with honey & lemon
- 2) Tea with suga
- 3) Green Tea
- 4) Coffee
- 5) None



From analysis of data, 44% people do not take any beverages in the morning, 15% consume lemon + honey, 17% consume tea with sugar, 10% consume green tea, 12% consume coffee. Beverage is a type of liquid which is specially prepared for human consumption .Many doctors recommend to take beverages in the morning. From studies, it has been proved that taking tea in the morning reduces cardiovascular risk by reversing endothelial vasomotor dysfunction in patients with coronary diseases(1). (2). Caffeine is a xanthine derivative that occurs in coffee beans, tea leaves, and coco beans . Studies have shown that caffeine can boost brain function in the short term; coffee induces arousing effects more in men than women (3). Studies show, caffeine consumed in coffee raises Blood pressure (4). It causes sleep disorder in adolescents (5) High caffeine intake in adolescents is associated with difficulty in sleep and feeling tired in the morning(6) .From literature survey and from analysis, it is found that there is no need to consume any beverages and it does not have any effect in the mornings.

B. Do you have breakfast regularly?

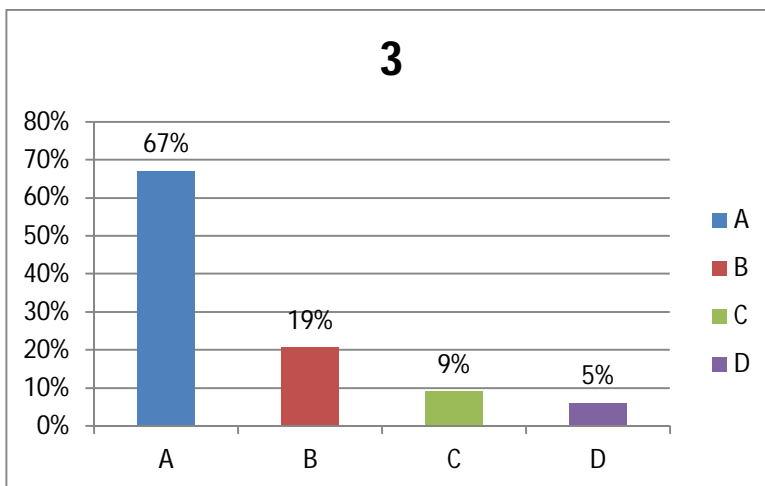
- 1) Daily
- 2) 1-2 days in a week
- 3) 3-4 days in a week
- 4) Never



The case study indicates that 52% of adolescents are consuming breakfast .20% are skipping breakfast for 3-4 days, and 17% are skipping for 1-2 days of week and 12% are skipping breakfast daily. Breakfast is one of the integral components of individual diet .48% are skipping breakfast and following irregular breakfast patterns. The breakfast skipping habit is associated with obesity and overweight (7). Skipping the breakfast induces hypothalamic -pituitary –ovarian dysfunction (8). Skipping breakfast also causes premenstrual abdominal pain, anorexia and premenstrual cramps (9). Breakfast is also widely promoted to improve cognitive function and academic performance, leading to the provision of breakfast initiatives by public health bodies. Evidence suggests that breakfast consumption may improve cognitive function related to memory, test grades, and school attendance. Breakfast as part of a healthful diet and lifestyle can positively impact children’s health and well-being. Parents should be encouraged to provide breakfast for their children or explore the availability of a school breakfast program. We advocate consumption of a healthful breakfast on a daily basis consisting of a variety of foods, especially high-fiber and nutrient-rich whole grains, fruits, and dairy products (10).

C. What kind of Food do You Prefer For Breakfast?

- 1) Regular food: Idli, Dosa, Chapathi, Puri, Bread, Cornflakes
- 2) Milk and milk products, Egg
- 3) Fruits, Sprouts
- 4) Tea, Coffee, Juices

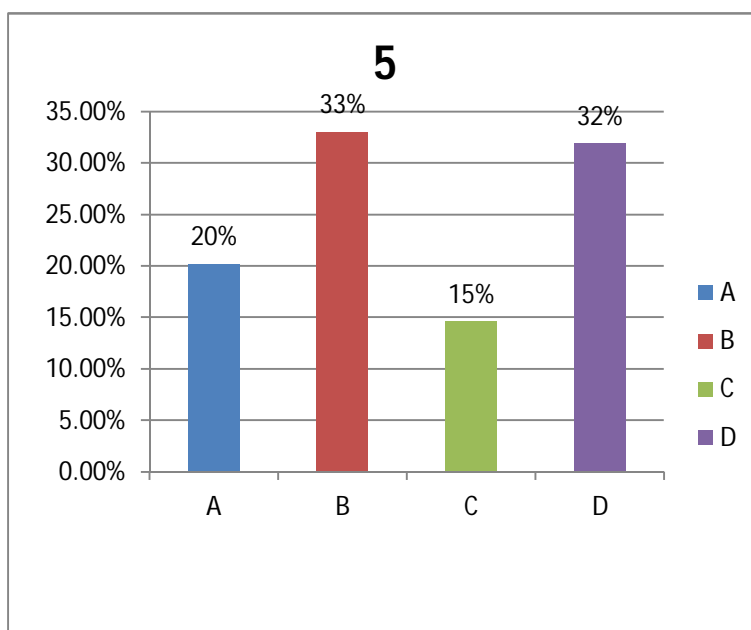


From the analysis we see that 67% of the adolescents eat carbohydrate rich cereals , 19% are seen to have milk and milk products or egg as a source of their protein, only 9% of the participants have nutrients and vitamin rich fruits and sprouts. 5% of them have tea, coffee and juices.

Adolescents do not follow any particular balanced diet pattern, they follow a carbohydrate rich diet .Breakfast is the most important meal of the day and it should consist of fibre , calcium, vitamin A, and vitamin C, riboflavin, zinc, iron as well as calories and less dietary fat for good health, this can be easily achieved by following a balanced diet using the food pyramid (11). Studies show that a protein rich breakfast improves appetite among youngsters (12).From the survey we see that adolescents have unsatisfactory knowledge about the dietary guidelines, nutrients sources and the food pyramid required for maintaining a balanced diet. It must be explained to them about the diet and disease relations and the importance of following a balanced diet for overall good health

IV. WHICH MEALS DO YOU REGULARLY EAT? TICK ALL APPLICABLE.

- A. Breakfast
- B. Lunch
- C. Brunch
- D. Dinner

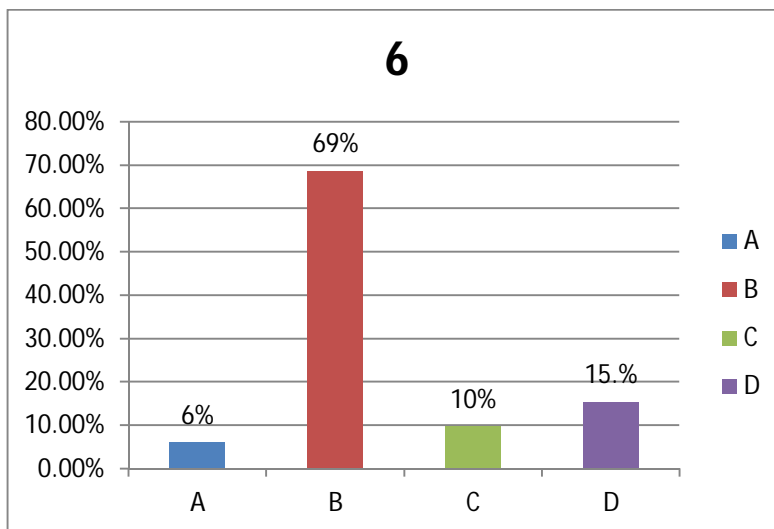


Here 32-33% of adolescents report on having lunch and dinner regularly while only 21% followed by 15% report to have breakfast and a mid day snack respectively. Proper pattern of eating wholesome 3 meals is not seen.

Adolescents require more calories when compared to adults .This increase in caloric need is required to meet the metabolic demands of growth and energy expenditure (13). Eating three regular meals a day with some snacks helps adolescents meet their nutrition needs. Skipping meals means adolescents will miss out on vitamins, minerals and carbohydrates, which can leave them in lacking energy or finding it hard to concentrate. Here proper knowledge in implementing the food pyramid guide can help fill the adolescent’s nutritional needs (14).

V. WHEN DO YOU SNACK?

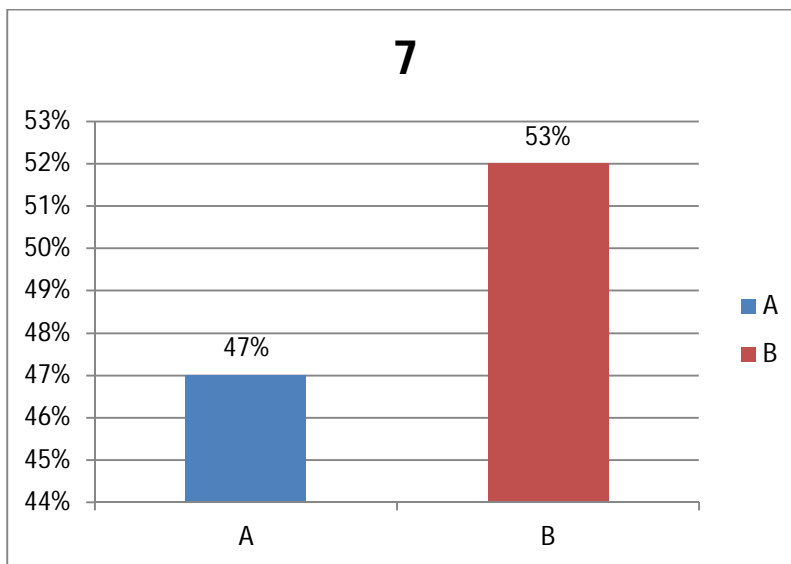
- A. Midmorning
- B. Evening
- C. Late night
- D. d) Throughout the day



From the survey, 69% of adolescents snack in the evening and 15% snack throughout the day. Adolescents snacking is usually observed after school or while watching TV or while hanging around with friends. Adolescents select snacks based on taste over nutrition. They often choose salty and crunchy foods over healthier alternatives which lead to overweight & obesity. Snacking behaviour in adolescence period has implications for the risk of developing chronic diseases. This study reveals that snacks replace regular meals which is not a healthy practice. It is necessary that nutritionist and dieticians to guide students, parents and guardians with purpose of changing adolescents behaviour towards food.

VI. DO YOU EAT OUT OR ORDER FOOD IN?

- A. YES
- B. NO

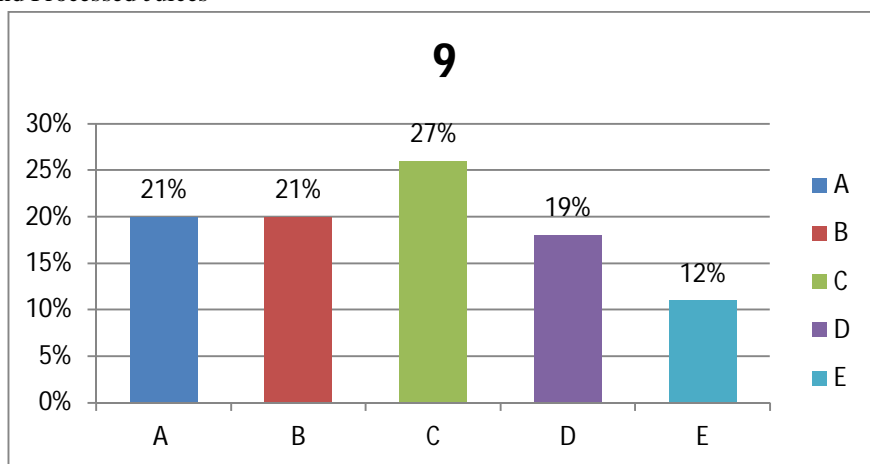


The analysis of data indicates that 47 percent regularly order outside food and 52 percent depend on other resources of food Production /food prepared in house. It is found that teenagers habitually snack on high –fat snack with regard to health related nutritional needs. The motivator in snack choices appears to be taste and high salt content. (15) The food intake lacks fibre and calcium which leads obesity problem .So the snacks should be replaced by vegetables/fruits, low-fat-high calcium snacks choices.(16) Adolescence is a crucial stage of lifestyle pattern and the modification take place by unhealthy food choices eating outside home which put adolescents to risk tasks, time, convenience and cost are major factor for ordering outside food .To achieve

healthy diet, base food consumption should be reduced nutrition intervention and nutrient education programmed has to be conducted as risk of obesity, type 2 diabetics are increasing (17)

VII. WHAT ARE YOUR FAVOURITE SNACK FOODS?

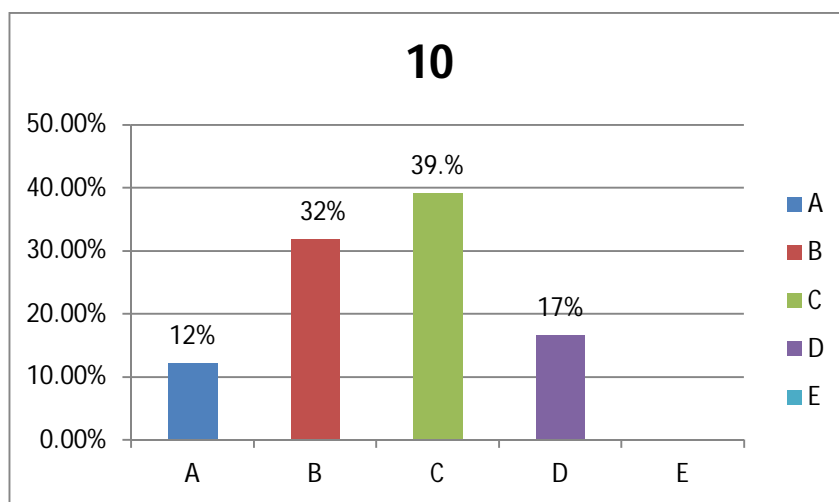
- A. Fast foods (Manchuria, Noodles)
- B. Junk foods (Pizza, Burger, Pani-puri, Indian chat)
- C. Homemade snacks (Pakodi, Vada, Maggi)
- D. Chocolates and sweets
- E. Cakes, Ice-creams and Processed Juices



From the survey 27% people prefer homemade snacks followed by fast foods and junk foods. Snacks prepared at home often meet the nutritional standards while those commercially prepared are questionable moreover the trans fat content is high in commercial snack foods. High Trans fat in food increases L.D.L (bad cholesterol) level, which on long-term is linked to cardiovascular diseases

VII. HOW OFTEN DO YOU EAT FRIED FOOD?

- A. Daily
- B. 1-3 days / week
- C. Once in a week
- D. Once / Twice month



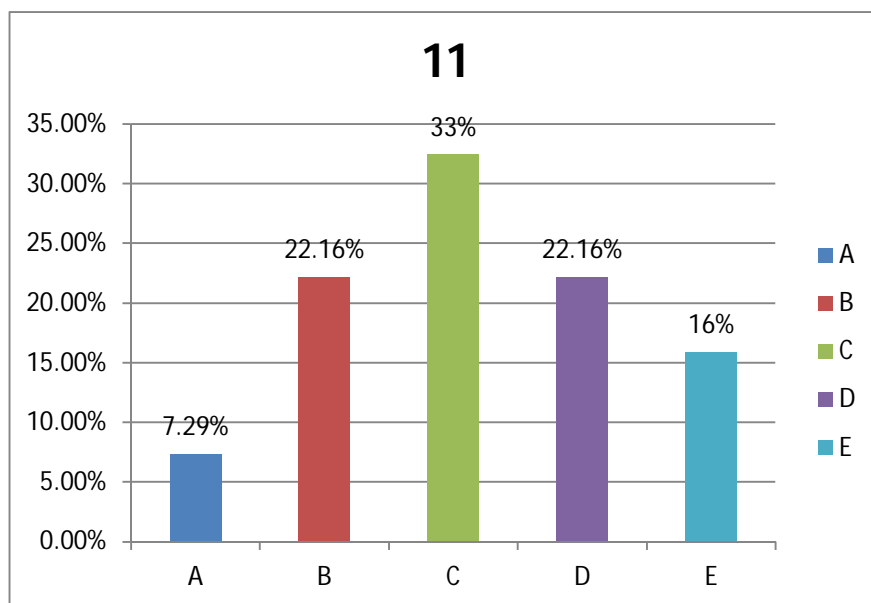
Here 39% of adolescents ate fried foods once a week while 32% ate fried food 1-3 days per week, 12% reported eating fried foods daily and 17% ate fried food once or twice a month

People who eat a lot of [fried foods](#) may have a higher risk of [type 2 diabetes](#) and [heart disease](#), according to a large, long-term study at Harvard university .(18)In this study , the researchers examined data from more than 100,000 men and women over about 25 years. They found that people who ate fried food at least once per week had a greater risk of both type 2 diabetes and heart disease, and that the risk increased as the frequency of fried food consumption increased. For instance, participants who ate fried foods 4-6 times per week had a 39% increased risk of type 2 diabetes, and those who ate fried foods 7 or more times per week had a 55% increased risk, compared with those who ate fried foods less than once per week.

Eating fried foods away from home—where frying oil may not be fresh—posed the greatest risk, Cahill the head of the research said. With each reuse, oil becomes more degraded, and more gets absorbed into food, which can contribute to weight gain, higher cholesterol, and igher blood pressure—all risk factors for type 2 diabetes and heart disease.

VIII. HOW IS YOUR FOOD USUALLY PREPARED? CHECK ALL THAT APPLY.

- A. Baked
- B. Boiled
- C. Fried
- D. Steamed
- E. Other

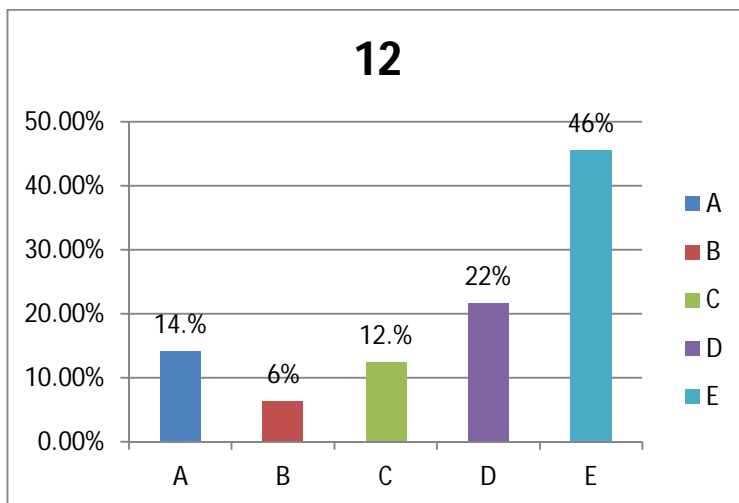


From the survey 33% people prefer fried foods followed by 22% boiled, 22% steamed and 7% baked foods.

There are many ways to cook food, while its well known that fried food is unhealthy many pay little or no attention to how various cooking methods effect the nutritional status of the food. Adolescents as seen from the survey have reported that they usually have food prepared by frying method in contrast to the other choices . Adolescents must be educated about the other healthier alternatives for preparing foods like, steaming, boiling, baking, grilling etc. Also the benefits inclusion of raw vegetables must be taught. Raw food diets have gained tons of attention recently, and for good reason. Many studies suggest there are of benefits of incorporating more raw foods into the diet. Studies have shown eating the rainbow diet (a diet containing a variety of colours of fruits and vegetables) consistently reduces the risk of cancer, but the jury’s out on whether raw or cooked is really best overall .(19)

IX. HOW OFTEN DO YOU EXERCISE?

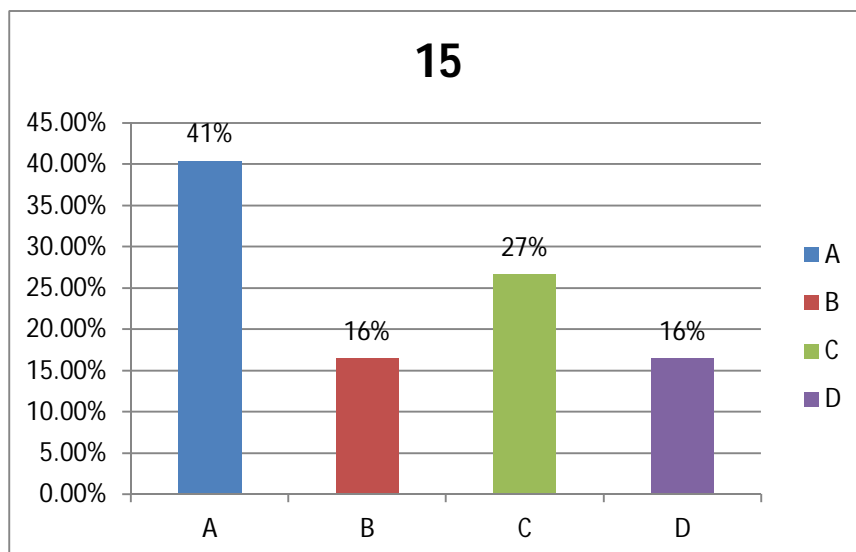
- A. Regularly
- B. 5 days
- C. 2-4 days/week
- D. Once / Thrice in a week
- E. Never

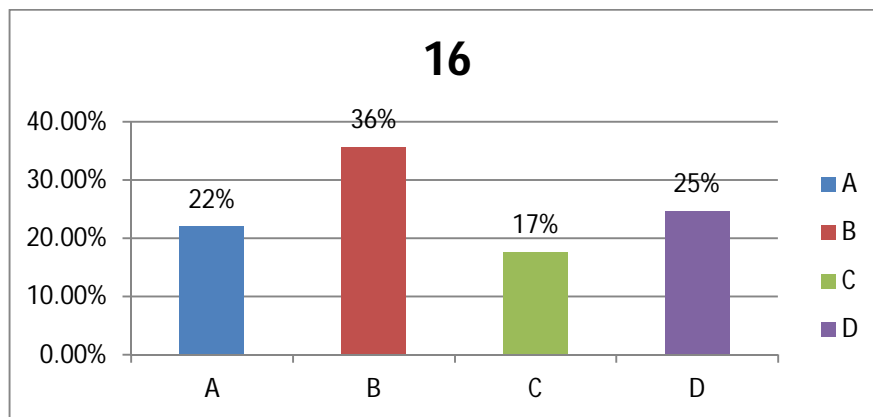


From the survey, 46% of adolescents report of “never” exercising followed by 22% working out once or thrice a week, then, 12% report doing it 2-4 days in week, 6% exercise 5 days per week and lastly 14% exercise on a daily basis. Exercise is an important part of keeping adolescents healthy. In recent years with emerging technology and economical improvement of status the activity levels of urban adolescent has become sedentary, lack of physical activity over long term is associated with a series of health problems, including obesity, blood pressure, diabetes, and cardiovascular ailments. Obesity being the major issue in adolescents. Studies on urban Indian schoolchildren from selected regions report a high prevalence of obesity among children. (20). Obesity is a risk factor of a host of different diseases and disorders like cardiovascular disease. Since habits formed during adolescents are more likely to stay into adulthood, physical activity must be encouraged. Adolescents need at least 60 minutes of moderate to vigorous physical activity on most days for maintenance of good health and fitness and for healthy weight during growth (21)

X. Your Food Preference at Dinner?

a. Chapathi, Oats, Brown rice / Polished rice	
b. Fruits and salads	
c. Meat, Fish, Chicken	
d. Milk and milk products	

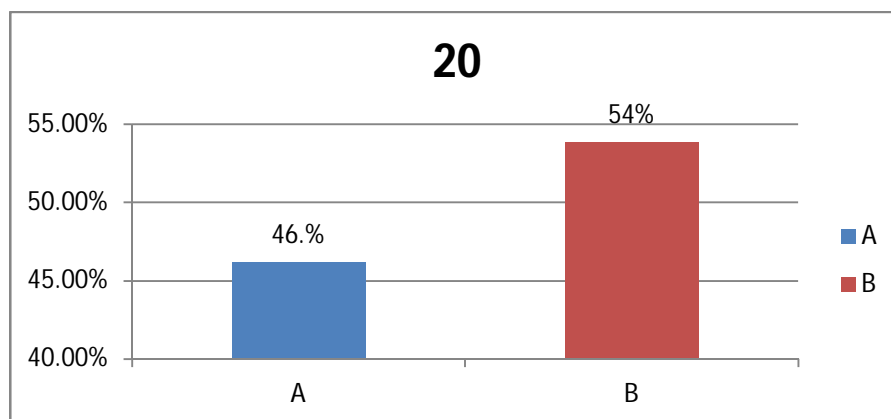




Many adolescents are suffering from various deficiencies, 22% of subjects have calcium deficiency, followed by 36% have iron deficiency while 17% report vitamin deficiency and 25% have reported to have other deficiencies. Few of the Subject’s Haemoglobin analysis was done at college using sahli’s haemoglobin meter, while many were aware of the deficiency they suffered from. Calcium deficiency disease, also known as hypocalcaemia, it increases the risk of developing diseases like osteoporosis. Vitamin D deficiency is a global health problem. With all the medical advances of the century, *vitamin D deficiency* is still epidemic. Over a billion people worldwide are vitamin D deficient or insufficient. Yet no international health organization or governmental body has declared a health emergency to warn the public about the urgent need of achieving sufficient vitamin D blood levels. Vitamin D3 deficiency can result in obesity, diabetes, hypertension, depression, fibromyalgia, chronic fatigue syndrome, osteoporosis and neuro-degenerative diseases including Alzheimer’s disease. Vitamin D deficiency may even contribute to the development of cancers, especially breast, prostate, and colon cancers (22). Iron deficiency is one of the national nutritional problems prevailing in India. Adolescents must consume the recommended amount of all the nutrients per day through the food they eat, supplements, or vitamins. This analysis sheds light on the percentage of the above deficiencies that adolescents are facing today. With this data, the required precise changes in the adolescent’s diet to tackle these deficiencies can be made and awareness can be spread regarding the same. The result of analysis is alarming were adolescents are not following a healthy diet nor visiting doctors for supplements. Adolescents must be educated on the long term implications that nutrient deficiencies bring. Healthy food choices and supplementation when necessary must be encouraged at home, at educational institutions and on social media.

X. DO YOU KEEP TRACK OF YOUR WEIGHT AND MAINTAIN IDEAL BODY WEIGHT?

- A. YES
- B. No



20. 54% women (Adolescents) do not follow ideal body weight and are not following / tracking their weight condition. According to studies, When people track their food intake and exercise levels, they usually eat less, exercise more, and lose weight (23). Self tracking gives immediate feedback on how choices accelerate or hinder ones progress. Self tracking also lets put ones minor mistakes into perspective, and take action to correct those mistakes. So regular health checkups, health campaign programmes are to be incorporated among college students.

XI. CONCLUSION

The main aim of the survey was to assess the dietary patterns of adolescents and then identify the negative habits and food choices that put them at risk of developing various health problems. This survey also helped to identify behaviour required for complete overall growth and healthy nutrition. Upon the analyses of the questionnaires filled by approx. 360 adolescent college going girls it was found that majority of them skipped breakfast. Of the total only 51% reported to having breakfast daily. Breakfast is the most important meal of the day and accounts for most the calories and nutrients. This suggests that adolescents require that they be educated on the importance of breakfast. Breakfast eating habit must be encouraged both at home and at educational institutions. Other major concerns that the analyses revealed were lack of a balanced diet and consumption of high fat & sugar containing snacks. The analyses further revealed adolescents lack of exercise in their daily regime. These habits suggest adolescents personally lack the knowledge of how these negative habits can have an overall impact on their health both on short and long term basis. Hence immediate action is required to limit the snacking among adolescents. This may be in the form of awareness campaigns or even banning of snacks can be implemented as a part of public health initiative. Nutritional deficiencies were also found in the adolescents, making the importance of following balanced diet all the more necessary. Also it was noticed that 54% of adolescents rarely kept track of their weight, suggesting that they also are unaware whether they are at their ideal weight or not. Thus, little yet effective changes in the dietary habits of adolescents can significantly improve the health status of both, the present adolescent and the future adult.

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