

Consumption of Hidden Sugars and Fats in Snacks by Adolescents

Ifraah Kulsum Khan¹, Asha G²

¹MSc Food and Nutrition, Smt VHD Central Institute of Home Science (Autonomous), Department of Food and Nutrition and Research centre, Seshadri Road, Bengaluru -560001

²Assistant Professor, Smt VHD Central Institute of Home Science (Autonomous), Department of Food and Nutrition and Research centre, Seshadri Road, Bengaluru -560001

Corresponding Author: Ifraah Kulsum Khan

ABSTRACT

Adolescent obesity is a leading global problem in the 21st century. It is increasing due to excess snack consumption, low physical activity, not following mindful eating. Objectives of the research were (1) To study consumption of hidden sugars and fats in snacks by adolescents, (2) To conduct market survey of packaged foods and to assess hidden sugar and fat content, (3) To assess dietary pattern and somatic status of subject. Methodology followed was Purposive random sampling of adolescents both girls and boys of age 16-18 years (N=100), questionnaire was constructed and validated, general information, anthropometric measurements and dietary information was collected, data was analysed statistically. Results and findings of this study were as follows; Majority (87) respondents were non-vegetarians and consumed snacks at least twice daily. 47 respondents skipped breakfast always. 41 percent of respondents overate when hungry due to skipping previous meal. Mean consumption of fat (26 grams) and sugar (28 grams) from snacks. Body mass index reveals that 37 respondents were in normal category, 21 respondents were underweight, waist hip ratio revealed 89 adolescents were obese. 45 respondents were involved in physical activity every day. 21 respondents binged on snacks at midnight as an effect of disturbed sleep. Skipping breakfast, increased the intake of snacks and low physical activity are contributing factors to increased BMI and abdominal obesity which leads to insulin resistance, diabetes, ischemic heart disease, high cholesterol levels and early morbidity in adulthood. There is a dire need for nutrition awareness among adolescence to make healthy food choices.

Key Words- adolescent, obesity, snacking, Hidden sugars, fat consumption

INTRODUCTION

Obesity is a paramount health problem of the 21st century, it affects about 10 percent of school aged children and 2.5 percent of adolescents. These children are more prone to morbidity in young adulthood. [1]

The World Health Organisation defines overweight and obesity as abnormal or excessive fat accumulation that may impair health.

Body mass index (BMI) is a simple index of weight-for-height that is commonly used to classify overweight and obesity in

adults. It is defined as a person's weight in kilograms divided by the square of his height in meters (kg/m²) [2]

The new age lifestyle of energy-rich diet, Low physical activity and energy expenditure are the main causative factors of excess fat accumulation and weight gain. Improper eating habits like snacking processed, high calorie foods, skipping of breakfast, bingeing and emotional eating, eating outside too often and not following mindful eating contribute to increased prevalence of adolescent obesity worldwide. [3]

The influence of western diets across the globe, snacking and eating outside meals are consumed regularly. Processed foods are manufactured by adding ingredients like salt, sugar or any other ingredient to foods such as canned fruits, vegetables, nuts, smoked meats, and cheese. Ultra-processed foods are foods manufactured by following multi ingredient addition such as sugar sweetened beverages, cookies, packaged breads, savoury snacks, ice cream, breakfast cereal, and ready to eat frozen meals. [4] The main source of adolescent's sugar intake included beverages (14.3 g, 20.5percent), fruits (10.9 g, 15.7percent), and bread products, confectionary, rice cake (8.9 g, 12.8percent). Of these, sugar intake from carbonated drinks was the highest among young people aged between 6 and 29.

Frequent consumption of sugary and increased fat snack foods can lead to nutritional problems. For example, over-consumption of sugar leads to the release of excessive insulin, which causes low blood sugar, affecting the central nervous system, which uses glucose as its source of energy; hence, it can cause hyperactivity disorder in adolescents. Moreover, when overweight adolescents consume too much sugar, they can become obese in adulthood and suffer from adult lifestyle diseases such as diabetes or cardiovascular diseases. Therefore, it is necessary for adolescents particularly to make particularly to make a continuous effort to control their sugar intake in order to maintain their health and prevent lifestyle diseases in adulthood. [5]

NEED OF THE STUDY

The new age lifestyle promotes development of obesity. Caloric excess (energy-rich diet) and low energy expenditure (physical inactivity) are the main causes for weight gain and excess body fat accumulation. Improper eating etiquettes such as snacking processed and calorie dense foods, skipping breakfast, emotional eating, eating outside too often and not following mindful eating are major

contributory factors in increasing the prevalence of obesity worldwide. [6]

Research plays a critical role in helping us understand and address our most serious health issues. Childhood and adolescent obesity have become a paramount health crisis in the past decade, and evidence from the field makes clear the factors fuelling this country's epidemic rates. [7]

AIM:-

To study consumption of hidden sugars and fats in snacks by adolescents.

OBJECTIVES:-

- ❖ To conduct market survey of packaged foods and to assess hidden sugar and fat content.
- ❖ To assess the consumption pattern of packaged foods among adolescents.
- ❖ To assess the dietary pattern and somatic status of the subjects.

MATERIALS AND METHODS

Study setting

The study was conducted in Bangalore district, Karnataka.

Study population

A total of 100 subjects aged between 16-18 years which had both adolescent boys and girls were taken for the study.

Sample size estimation

Adolescents of age: 16-18 years: 100

Total sample size (n): 100

Sample selection procedure

Purposive random sampling was done to select the samples for the study. Adolescents (16-18 years) both boys and girls were selected.

Inclusion and exclusion criteria

Inclusion criteria:

- Adolescents (16-18 years) both boys and girls.
- Resident of Bangalore district, Karnataka.

Exclusion criteria:

- Physical challenged adolescents.

Questionnaire Pattern

Part 1	General Information (name, age, gender, class studying, ordinal position, no.of siblings, type of family, Religion)
Part 2	Diet survey (type of diet, general meal pattern, breakfast, lunch, snacking, overeating)
Part 3	Somatic status (height, weight, hip and waist measurements)
Part 4	Consumption of snack (biscuits, chips/crisps, juices, chocolates, cakes, ice creams, jams, spreads and syrups)
Part 5	Physical activity and recreational activities

The study was conducted in Bangalore District, Karnataka. A total of 100 subjects aged between 16-18 years which had both adolescent boys and girls were taken for the study.

Purposive random sampling was done to select the samples for the study. Adolescents (16-18 years) both boys and girls were selected.

The study involved purposive sampling technique with age. A structured close ended questionnaire (Google form)

was adapted. The study was carried out in Bangalore amongst the 100 adolescents. The subjects were briefed about the study and then the questionnaire was circulated to fill it.

Statistical Analysis

Statistical Analysis included coding and decoding of the questions and the same was subjected to statistical analysis. The data was classified, tabulated and expressed at mean, standard deviation and percentage.

RESULTS AND DISCUSSION

TABLE – 1: Response On Frequency Of Eating Snacks And Overeating When Hungry

Characteristics	Category	Respondents	
		Number	Percent
Frequency of snack consumption/day	Once	50	50.0
	Twice	22	22.0
	More than 2 times	28	28.0
Overeat when hungry	Most of the times	41	41.0
	Sometimes	46	46.0
	Never	13	13.0
Total		100	100.0

Majority i.e. 50 percent of respondents consumed snacks once a day, 28 percent of respondents consumed a snack more than two times a day followed by 22 percent of the respondents consumed snacks twice a day.

With respect to overeating when hungry, it was found that 41percent of respondents overeat most of the times, 46percent of respondents overeat sometimes and 13 percent of respondents never overeat when hungry.

The prevalence of snacking (defined as the consumption of foods and drinks between meals including Biscuits, Chips, Chocolates, Cakes, Juices, Ice creams, Jams and Syrups) among adolescents and children varies widely across the world. Adolescents select snacks based on taste over nutrition, they more often choose salty, crunchy foods as snacks over healthier alternatives. The frequency of these snacking behaviours may

be important to address as part of interventions designed to promote health and to prevent adolescent obesity because there are consistent associations with higher total daily energy intake and higher sugar and fat intake. [8]

Overeating when hungry is a common phenomenon where individual eats more than required or intake of high calorie (sugar and fat) food or snack. Emotional eating, not practicing mindful eating, skipping meals, and eating outside are some ways where an individual tends to overeat. Overeating regularly may cause increase in weight, abdominal obesity, and increased waist to hip ratio in adolescents.

TABLE – 2: Mean Consumption Of Fat And Sugar From Snacks By Gender, N=100

No.	Nutrients	Respondents				't' Test
		Boys (n=21)		Girls (79)		
		Mean	SD	Mean	SD	
1	Fat (g)	14.10	9.4	12.0	8.7	0.92 ^{NS}
2	Sugar (g)	15.1	6.1	13.2	8.1	1.18 ^{NS}

NS : Non-significant, t (0.05,98df) = 1.96

Mean fat and sugar consumption from only snacks per day was found to be 26 grams of fat and 28 grams of sugar by both boys and girls. The consumption of sugar and fat in boys and girls were found to be statistically non-significant for fat ($t=0.92^{NS}$) and sugar ($t=1.18^{NS}$).

The fat and sugars from snacks consumed is apart from the fat and sugar consumed from regular meals, hence it is excess. Frequent consumption of sugary and high fat snack foods can lead to nutritional problems. For example, over-consumption of sugar leads to the release of excessive insulin, which causes low blood sugar, affecting the central nervous system, which uses glucose as its main source of energy; hence, it can cause hyperactivity disorder in adolescents. Moreover, when overweight adolescents consume too much sugar, they can become obese in adulthood and suffer from adult lifestyle diseases such as diabetes or cardiovascular diseases.

TABLE-3: Classification Of Snacks Based On Fat Content

Sl no.	Category Of Snack	Average fat content (gm/100gm)	Type Of Fat Used
1	Biscuits	19	palmolien, canola
2	Chips	39	palmolien, rice bran
3	chocolates	24	edible vegetable fat (palm)
4	Cakes	19	palmolien oil
5	Ice-creams	22	edible vegetable fat

It was found that Chips contained 39 grams of fat, followed by chocolates containing 24 grams of fat. Ice creams were found to contain 22 grams of fat, cakes contained 19.45 grams fat and biscuits contained 18.6 grams.

Adolescent eats at least 60-70 grams of chips i.e. 2 packs, 1 chocolate, 50-60 grams of biscuits which contributes to an excess fat intake of 30-40 grams/day. Contributing to obesity and other non-communicable diseases at a young age.

With respect to type of fat used in processed foods in India, Palmolien is used due to low cost. Palm oil is one of the world's most commonly used vegetable oils, present in around half of frequently used

food and consumer products, from snacks to cosmetics.

Palm oil contains a much higher percentage of saturated fats compared to other vegetable oils. Although its negative health impacts are contested, a meta-analysis of increased palm oil consumption in 23 countries found a significant relationship with higher mortality from ischaemic heart disease. [9]

TABLE 4: Classification of snacks based on sugar content

Sl no.	Category Of Snack	Range of sugar (gm/100gm)	Hidden Sugar
1	Biscuits	26.3	invert syrup, dextrose
2	Juices	11.58	Nil (cane sugar)
3	chocolates	54.07	invert syrup
4	Cakes	28.3	maltose syrup
5	Ice-creams	22.66	liquid glucose
6	Jams and Syrups	63.6	invert sugar

Maximum sugar was found to be in jams and syrups i.e. 63.6 grams followed by chocolates containing 54.07 grams, cakes contained an average of 28.3 grams, biscuits contained 26.3 grams of sugar, Ice-creams contained 22.66 grams and juices contained 11.58 grams of sugar.

Over-consumption of sugar leads to dental caries (foods and beverages that are high in acids and sugar wear away the enamel that protects your teeth, a process known as tooth erosion. This changes the appearance of your teeth and opens the door for bacteria that can cause cavities or infection.) the release of excessive insulin which causes low blood sugar, affecting the central nervous system, which uses glucose as its main source of energy; hence, it can cause hyperactivity disorder in adolescents. Moreover, when overweight adolescents consume too much sugar, they can become obese in adulthood and suffer from adult lifestyle diseases such as diabetes or cardiovascular diseases. Therefore, it is necessary for adolescents particularly to make particularly to make a continuous effort to control their sugar intake in order to maintain their health and prevent lifestyle diseases in adulthood. [10]

CONCLUSIONS

There is a dire need for nutrition awareness among adolescents, to make healthy food choices, reduce high caloric intake, practice regular physical activity and to follow mindful eating. Parents also play an important role in bettering the health status of an adolescent. They must be educated on adverse effects of fats and sugar from snacks for a healthier and better-quality life. A healthy adolescent grows into a healthy adult.

Limitations

- ❖ The sample size was limited to 100
- ❖ The age of the sample is between 16-18 years.

Further research recommendations

- It is recommended to research to have deeper studies on the relationship between their dietary eating habits and physical activity.
- Quantification of fat and sugar from regular meals is to be assessed

ACKNOWLEDGEMENT

I am thankful to the Almighty for bestowing me with the strength and knowledge which helped me successfully complete my Research.

I would like to express my sincere gratitude to

- Dr. Usha Devi. C Head of the Department, Department of Food and Nutrition and Research Centre, Smt. V.H.D Central Institute of Home Science (Autonomous), Bengaluru.
- Dr. Asha. G, Associate Professor, Department of Food and Nutrition and Research Center, Smt. V.H.D Central Institute of Home Science (Autonomous), Bengaluru.
- Dr. K.S Roopa, Principal of Smt. V.H.D Central Institute of Home Science (Autonomous)
- Prof. Surendra HS, Associate Professor, Department of Statistics, GKVK, Bengaluru.

My parents Nishat Ali Khan and Nigar Anjum Khan, my first inspiration my grandmother -Meher Sultana, my sibling, family and friends for their encouragement, motivation and moral support rendered throughout the endeavour without whom this study would have been a distant reality.

Conflict of Interest: None

Source of Funding: None

Ethical Approval: Approved

REFERENCES

1. Lavizzo-Mourey, R. (2009). The adolescent obesity epidemic. *Journal of adolescent health, 45(3)*, S6-S7.
2. World Health Organisation- Obesity And Overweight
3. Kuźbicka, K., and Rachoń, D. (2013). Bad eating habits as the main cause of obesity among children. *Pediatr Endocrinol Diabetes Metab, 19(3)*, 106-110.
4. Poti, J. M., Braga, B., and Qin, B. (2017). Ultra-processed food intake and obesity: what really matters for health—processing or nutrient content? *Current obesity reports, 6(4)*, 420-431.
5. Dasgupta, R., Pillai, R., Kumar, R., and Arora, N. K. (2015). Sugar, salt, fat, and chronic disease epidemic in India: is there need for policy interventions? *Indian Journal of Community Medicine: Official Publication of Indian Association of Preventive and Social Medicine, 40(2)*, 71.
6. Kuźbicka, K., and Rachoń, D. (2013). Bad eating habits as the main cause of obesity among children. *Pediatr Endocrinol Diabetes Metab, 19(3)*, 106-110.
7. Lavizzo-Mourey, R. (2009). The adolescent obesity epidemic. *Journal of adolescent health, 45(3)*, S6-S7.
8. Savige, G., MacFarlane, A., Ball, K., Worsley, A., & Crawford, D. (2007). Snacking behaviours of adolescents and

- their association with skipping meals. *International Journal of Behavioral Nutrition and Physical Activity*, 4(1), 1-9.
9. World Health Organisation- The palm oil industry and noncommunicable diseases
10. Gupta, P., Gupta, N., Pawar, A. P., Birajdar, S. S., Natt, A. S., and Singh, H. P. (2013). Role of sugar and sugar substitutes in dental caries: a review. *International Scholarly Research Notices*, 2013.
- How to cite this article: Khan IK, Asha G. Consumption of hidden sugars and fats in snacks by adolescents. *Int J Health Sci Res.* 2021; 11(7): 374-379. DOI: <https://doi.org/10.52403/ijhsr.20210751>
