

Dietary habits of school going adolescents - A cross-sectional study

¹Dr. Aaysuh Aggarwal, Junior Resident, Department of Paediatrics, Gajra Raja Medical College, Gwalior M.P.

²Dr. Ashutosh Sharma, Senior Resident, Department of Paediatrics, Gajra Raja Medical College, Gwalior M.P.

³Dr. Sunita Koreti, Professor, Department of Paediatrics, Gajra Raja Medical College, Gwalior M.P.

⁴Dr. Ajay Gaur, Professor and Head, Department of Paediatrics, Gajra Raja Medical College, Gwalior M.P.

Corresponding Author: Dr. Sunita Koreti, Professor, Department of Paediatrics, Gajra Raja Medical College, Gwalior M.P.

How to citation this article: Dr. Aaysuh Aggarwal, Dr. Ashutosh Sharma, Dr. Sunita Koreti, Dr. Ajay Gaur, “Dietary habits of school going adolescents - A cross-sectional study”, IJMACR- May - June - 2022, Vol – 5, Issue - 3, P. No. 145 – 154.

Copyright: © 2022, Dr. Sunita Koreti, et al. This is an open access journal and article distributed under the terms of the creative commons attribution noncommercial License 4.0. Which allows others to remix, tweak, and build upon the work non-commercially, as long as appropriate credit is given and the new creations are licensed under the identical terms.

Type of Publication: Original Research Article

Conflicts of Interest: Nil

Background: Healthy eating habits are defined as eating practices and behaviors that are consistent with maintaining and improving physical and mental health of a person.¹ They play a major role in quality of life, health and longevity. The present study was cross sectional study carried out in randomly selected government and private schools from urban and suburban regions of Gwalior. The main objectives of studies were to study the dietary habits and food preferences among school going adolescents.

Material and methods

Cross sectional Study was carried out in randomly selected government and private schools from urban and suburban regions of Gwalior. A total of 1000 adolescents between the ages of 10-19 years were selected from these schools. Due to Covid 19 pandemic as schools were closed so children’s attending OPD were included Anthropometric Parameters recorded were Weight Height and Triceps skin fold thickness these

measurements were taken using Electronic weighing scale Stadiometer, Harpenden skin fold caliper and ICMR based food frequency questionnaire BMI was calculated using Weight and height Data were entered in Microsoft excel software and analysis were performed on SPSS 22 version.

Results: The current study found that 29.2% adolescents were underweight and 13.9% were overweight or obese Females were significantly more underweight (34.5%) as compared to males (24.1%). Males were significantly (17.7%) more overweight or obese as compared to females (9.9%). Study also found significant difference in triceps skin fold thickness (TSFT) among males and females in the age group 13-15 years and 16-19 years. Majority of males and females (64%) had vegetarian diet. Participants consuming mixed diet had significantly higher proportion of underweight (30.3%) and overweight/obese (16.7%) adolescents

Conclusion: The present study recommends that Adolescent dietary habits should be monitored frequently by the family members and school authorities they should be taught about the concepts of balanced diet from early phases of school education

Keywords: Junc Foods BMI, Dietary Habits and Anthropometry

Introduction

Healthy eating habits are defined as eating practices and behaviors that are consistent with maintaining and improving physical and mental health of a person.¹ They play a major role in quality of life, health and longevity. They promote the concept of balanced diet. A balanced diet is defined as nutritionally adequate and appropriate intake of food items that provide all the nutrients in required amount and proper proportions to ensure normal growth, development and disease-free optimum health among children and adolescents. Food groups differ in their nutrient quality and quantity hence while planning a diet, inclusion of one or more food items from each of these groups is essential to label a diet as balanced. In a normal balanced Indian diet, Carbohydrates should make up 55–60%, proteins 10–12% and fats 25–30% of total caloric intake.² Not more than 10% of total calories should be derived from saturated fatty acids and approximately 10% each from monounsaturated and polyunsaturated fatty acids.³ Dietary intake of total cholesterol should be limited to 300 mg/day. Free sugars should constitute no more than 10% of total caloric intake. Salt intake should be less than 5 grams per day.⁴ Eating a balanced diet and establishing healthy eating habits promotes health, helps in growth and intellectual development across the life course. A healthy diet and body weight decreases the risk of ill health and incidence of non-communicable

diseases. An unhealthy and unbalanced diet with high consumption of energy-rich, nutrient-poor foods is an important factor in the current epidemic of obesity and non-communicable diseases.⁵

World Health Organization (WHO) has defined adolescents as people between 10-19 years of age.⁶ Globally there are 1.2 billion adolescents, nearly one-sixth of total global population. There are nearly 360 million adolescents comprising about 20% of the population in the countries of the South-East Asia region.⁷ Adolescence is a transitional phase of life between childhood and adulthood and an important stage of human development and an essential period for laying the foundations of good health.⁸ It is one of the most dynamic periods of life, characterized by rapid physical, social, cognitive and emotional changes, all occurring at the same time which affects their thinking, decision making and interaction with the environment around them.⁷ During this phase adolescent acquires and establish patterns of behaviors including dietary habits and behaviors that can either protect their health or put their health at risk now or in the future.⁸ It is a vulnerable period of life as health-related behaviors that drive the major chronic degenerative diseases in adulthood start or are reinforced during this time.⁹ Hence there is a need to evaluate the dietary habits and food preferences among adolescents and educate adolescents and their parents regarding healthy dietary habits to ensure that children and adolescents can live healthy and productive life as adults.

Material and Methods

This cross-sectional study was conducted in randomly selected government and private schools from urban and suburban regions of Gwalior from June 2019 –August 2021. A total of 1000 adolescents between the ages of

10-19 years were selected from these schools. Ethical permission was taken from institutional ethical committee, Gajra Raja Medical College, Gwalior. Adolescents who were suffering from any acute or chronic illness and on any long-term medications were excluded. Anthropometric measurements were taken using electronic weighing scale, stadiometer, Harpenden skin fold caliper and ICMR based questionnaire. Permission for conducting the study was taken from the principal of the school. Consent was obtained from the adolescents or their parents/guardians with the help of school authorities. Assent was taken from adolescents between 10-12 years of age. (Fig 1)

During COVID-19 pandemic, when schools were closed as per government norms along with earlier mentioned sample population, school going adolescents attending OPD for minor illnesses and adolescent siblings of patients admitted in pediatric ward were included in our study to achieve target study sample without any change in data collection methods. The permission for the same was sought from institutional ethical committee, Gajra Raja Medical College, Gwalior. The school study was carried out in strict accordance to Covid appropriate behaviors.

This cross-sectional study was performed by providing ICMR based food frequency questionnaire (FFQ) to school going adolescents to assess their dietary intake in previous 7 days. Proforma was framed using nutritional assessment guidelines of ICMR and UNICEF and some modifications were done according to locally available and accepted food after pilot study. Socio-economy status of the participants was assessed by Modified Kuppuswamy scale. Determinants of Modified Kuppuswamy scale were part of

Fig 1: Algorithm of Methodology

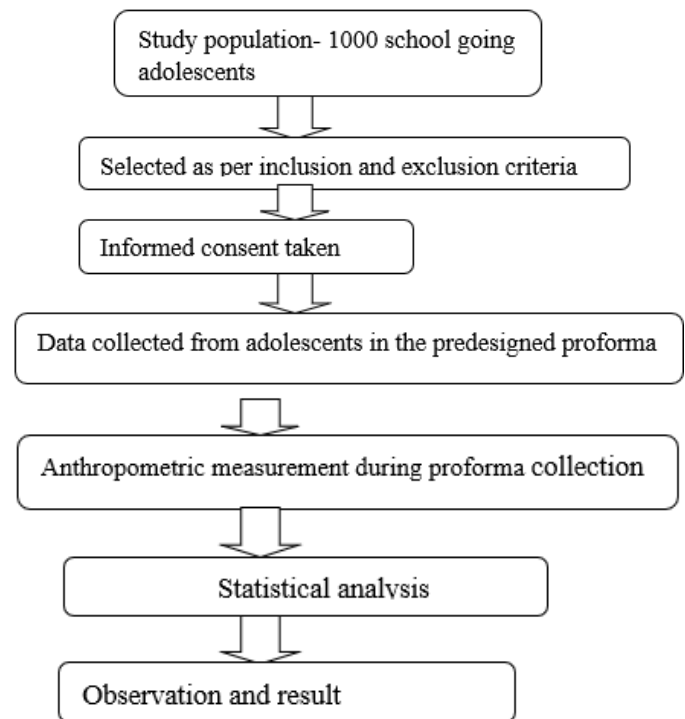


Table 1: Distribution of the study participants according to Socioeconomic class.

Socioeconomic class	Frequency	Percentage
Upper	14	1.4%
Upper Middle	81	8.1%
Lower middle	285	28.5%
Upper lower	377	37.7%
Lower	243	24.3%
Total	1000	100%

Proforma given to participants. Height and Weight of participants was taken after completion of Proforma and BMI was computed. Triceps Skin fold thickness (TSFT) was recorded after completion of Proforma using skin fold caliper. Anthropometric parameters that was measured were Weight Height and Triceps fold Weight was measured using digital portable weighing scale to the near set 0.1 kg for accuracy with minimal clothing and minimal footwear¹⁰.

Height was measured using a stadiometer to the nearest 0.1 cm for accuracy in light clothing and without shoes.¹⁰

The TSFT was measured using a ‘Harpden skinfold calliper’ calibrated to exert a constant pressure of 10gm/mm² on the left side to the nearest 0.20 mm. The TSF was measured at least three times and the average taken or until the same value was recorded consecutively. The measurements for all patients were carried out by the same observer.

BMI (Body mass index) is a measure of weight adjusted for height BMI is a simple inexpensive and noninvasive method to assess nutritional status of an individual. Data were entered in Microsoft excel software and analysis were performed on SPSS 22 version. For the qualitative characteristics frequency and percentage were shown. For quantitative data, mean with their standard deviation were shown. To see the association between the dietary habits and demographic profile, BMI and skin fold thickness P value were calculated and statistical significance were seen at 5%. Multiple bar chart and bar diagrams were shown for the graphical presentation of data.

Results

The current study was done to assess the dietary habits in school going adolescents 1000 school going adolescents were included in study. Their dietary habits and pattern were studied according to dietary preform filled by them. Socio economic status was classified according to modified Kuppaswamy socioeconomic scale Among 1000 school going adolescents, 1.4% belonged to upper class, 8.1% belonged to upper middle class, 28.5% belonged to lower middle class, 37.7% belonged to upper lower class and 24.3% belonged to

lower class. Most Subjects belonged to upper lower followed by lower middle class.

Among study participants, 29.2% adolescents were under weight, 24.1% males and 34.5% females were under weight. 56.9% adolescents had normal weight, 58.2% males and 55.6% females had normal weight. 10.9% adolescents were overweight, 13.6% males and 8.1% females were overweight. 3% adolescents were obese, 4.1% males and 1.8% females were obese. Females were significantly more underweight as compared to males ($p < 0.001$). Males were significantly more overweight and obese as compared to females ($p < 0.001$). (Fig 3)

Fig 2: BMI of study participants

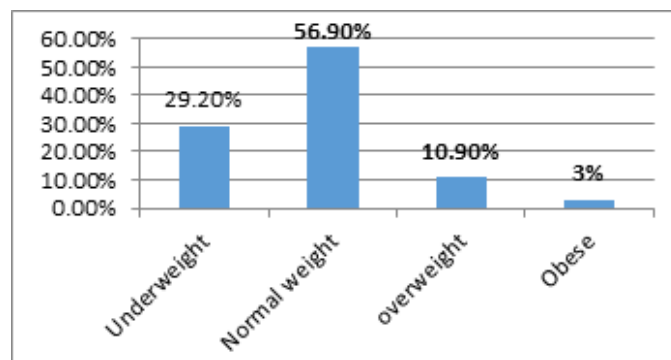
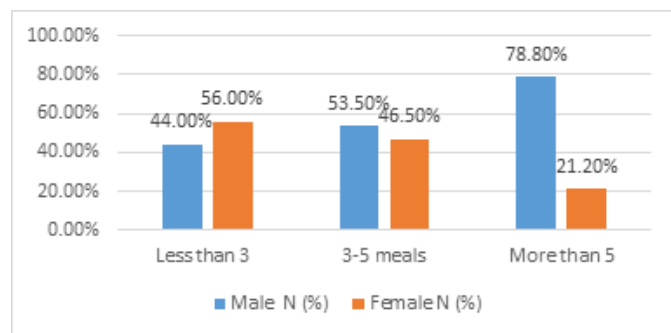


Fig 3: Daily meal frequency among study participants



Among study participants in the age group 10-12 years, TSFT was 10.60±2.13 among males and 10.99±1.95 among females. ‘P’ value is 0.143. In the age group 13-15 years, TSFT was 10.76±1.61 among males and 12.55±2.05 among females. ‘P’ value is <0.001. In the age group 16-19 years, TSFT was 12.37±1.78 among

males and 13.77 ± 1.71 among females. 'P' value is < 0.001 . Females had significantly more TSFT compared to males in the age group 13-15 years and 16-19 years.

Dietary habits of study participants

Among study subjects, 64% participants were vegetarians and 36% had mix diets. 60.2% males were vegetarians and 39.8% males had mix diets. 67.9% females were vegetarians and 32.1% females had mix diets. There was significant correlation between type of diet and gender of our participants ($p = 0.012$). Vegetarian diet was more common among females. Mix diet was more common among males as compared to females.

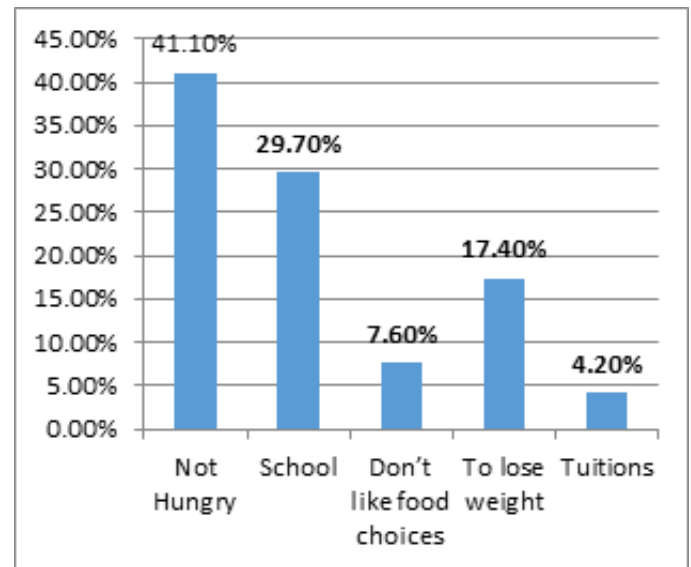
Dietary meal frequency among study participants

Among 1000 school going adolescents, 38.4% adolescents consumed less than three meals a day. 33.3% males and 43.6% females consumed less than 3 meals a day. 58.3% adolescents consumed three to five meals a day. 61.5% males and 54.9% females consumed 3-5 meals a day. 3.3% adolescents consumed more than five meals a day. 5.2% males and 1.4% females consumed more than five meals a day. There was significant correlation between meal skipping and gender of our participants ($p < 0.001$). Meal skipping was significantly more common among females as compared to males (Fig 4).

Meal skipping habits

Among 384 meal skippers, 69.5% missed their breakfast, 27.6% missed their lunch and 2.9% missed their dinner. Among 384 meal skippers, most common reason for skipping meal by adolescents was not feeling hungry, followed by not getting time because of schools. Other reasons were to lose weight, not liking food choices and not getting time due to tuitions. (Fig 5)

Fig 4: Reason for 'skipping meal' habit among study Participants



Food preference among study participants

Snacks were the most liked food products. Most liked food item was burger (9.8%). Most liked food items among females were cholebhature (9.9%), burger (9.9%), ice-cream (8.9%), dal chawal (7.3%) and chicken (7.1%). Most liked food items among males were burger (9.6%), samosa (9.3%), chicken (6.7%), aloo Tikki (6.3%) and dal chawal (5.5%).

Least liked food among study participants

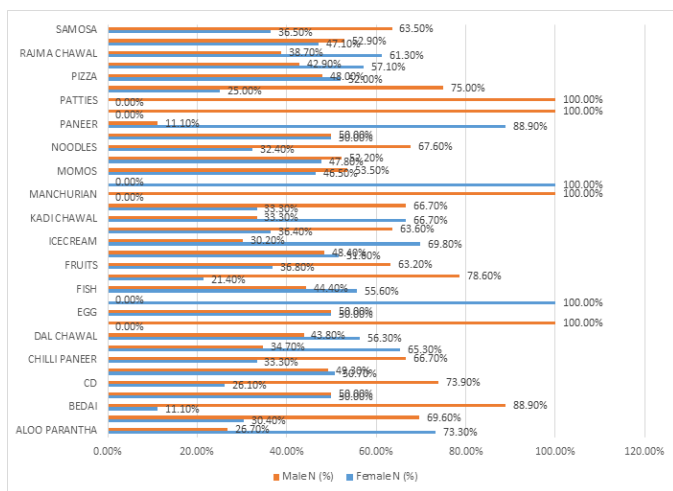
In this study, least liked food items among adolescents were green vegetables (43.1%) and milk (30.3%).

Frequency of different foods among study participants

Among 1000 school going adolescents, 91.7% adolescents consumed cereals 2-3 times a day and 8.3% of them consumed cereals daily. 61.8% adolescents consumed pulses/legumes more than once a week, 32.8% consumed it once or more than once daily and 5.4% consumed it once a week. 66.7% adolescents consumed green vegetables more than once a week, 16.4% consumed it once or more than once daily and 16.9% consumed it once or less than once weekly.

34.5% adolescents consumed other vegetables more than once a week, 65.5% consumed it once or more than once daily. 10.3% adolescents consumed eggs/non-vegetarian food items more than once a week, 25.7% consumed it once or less than once weekly. 63.6% adolescents consumed fruits more than once a week, 22.4% consumed it once or more than once daily and 14% consumed it once or less than once weekly. 53% adolescents consumed snacks more than once a week, 28.7% consumed it once or more than once daily and 18.3% consumed it once or less than once weekly (Fig 6).

Fig 5: Food preferences/favorite food among study participants



Discussion

The present study ‘Dietary habits of school going adolescents: A cross –sectional study’ was conducted in randomly selected government and private schools from urban and suburban regions of Gwalior to study the dietary habits and food preferences among school going adolescents and correlate them with their demographic profile, BMI and skin fold thickness.

The current study found that 29.2% adolescents were underweight and 13.9% were overweight or obese. Similar results was found in study conducted by Gautam

Laxmi et al¹¹ among 15-19 years of school going adolescents from Butwal, Nepal, 23.6% adolescents were underweight and 9.4% were overweight or obese. Study also found significant difference in triceps skin fold thickness (TSFT) among males and females in the age group 13-15 years ($p < 0.001$) and 16-19 years ($p < 0.001$). There was no significant difference found in TSFT between males and females in the age group of 10-12 years ($p = 0.143$). In the current study, majority of males and females (64%) had vegetarian diet. Contrary results were found in another study conducted by Mukherjee Reema et al¹² on 760 students of a single school in Pune city on children from 5 to 11 years of age, 55.40% of the children were non-vegetarians while 6.71% were pure vegetarians.

Significant correlation between type of diet and socio-economic class was found ($p < 0.001$) in the current study. Present study found that vegetarian diet was more common among participants from higher socio-economic class (72.7%). Mixed diet was more common in participants from lower socio-economic class (42.9%) as compared to higher socio-economic class (27.3%). In another similar study conducted by OmidwarShabnam et al¹ they found highest percentage of vegetarians (46.2%) belonged to higher socio-economic class and in lower socio-economic class highest percentage of mixed diet (65.2%) was present.

Present study found correlation between type of diet and BMI of the participants ($p < 0.001$). Participants consuming mixed diet had significantly higher proportion of underweight (30.3%) and overweight / obese (16.7%) adolescents. Contrary results were found in another study conducted by Ameer Shaik Riyaz et al.¹³ adolescents consuming vegetarian food (67.5%) were more frequently underweight than children eating

non veg food (50.4%) [OR: 1.97;95% CI (1.35-2.88)]; $P < 0.05$.

In the current study, most of the adolescents consumed three to five meals a day. 38.4% adolescents consumed less than three meals a day. In another study conducted by Hazzaa M Al-Hazaa et al¹⁴ among children 6-12 years of age from Jeddah, nearly 80% of the children skipped daily breakfast at home.

Present study found correlation between meal skipping and gender of the participants ($p < 0.001$). Meal skipping was more common among females (43.6%) as compared to males (33.3%) in the current study. Similar results were found in another study conducted by Kotecha P.V. et al,¹⁵ they found 30% of boys and 40% of girls missed a meal once or twice a week whereas 5% of adolescents missed their meals 3 to 4 times a week a

There was correlation between meal skipping and age of the participants ($p < 0.001$) in the current study. Present study found that meal skipping was more frequent among adolescents between 13-15 years of age (45.9%). In another study conducted by Hazzaa M Al-Hazaa et al¹⁴ no significant age or gender differences were seen among children skipping breakfast.

Present study found significant correlation between frequency of meals and socio-economic class of the participants ($p < 0.001$). In the current study, 64.2% adolescents belonging to socioeconomic class I were skipping meals. In another similar study conducted by OmidwarShabnam et al¹ highest percentage of meal skipping was related to lower socio-economic class. They also found meal skipping was significantly higher among adolescent females (53.9%) as compared to adult females (49.1%).

In the current study, there was significant correlation between meal skipping and BMI of the participants ($p <$

0.001). 58.6% of underweight and 53.2% of overweight adolescents skipped their meals. Similar results were found in another study conducted by OmidwarShabnam et al¹ correlation between meal skipping and BMI of participants) was present. They found 55.4% underweight and 58.6% of overweight and obese adolescents skipped their meals. In another study conducted by Ming Li et al.¹⁶ higher prevalence of overweight and obesity was seen in those skipping breakfast. In a study conducted by Bhattacharjee Rasun et al.¹⁷ skipping breakfast daily was associated with high BMI ($p = 0.010$).

In the current study, among meal skippers, majority of the adolescents accepted that they missed their breakfast, nearly one-fourth missed their lunch and some missed their dinner. In another study conducted by Savige Gayle et al¹⁸ they found that on a daily basis, 20% adolescents skipped breakfast, 12% skipped lunch and 2% skipped dinner. In another study conducted by Shukla Nir pal et al.¹⁹ among adolescent's females from Barabanki (U.P.), 22.6% girls never took breakfast before coming to school and only 16.9% girls had daily breakfast.

Most common reason in the current study for skipping meals by adolescents were not feeling hungry, not getting time because of schools. Other reasons were to lose weight, not liking food choices and not getting time due to tuitions. Similar results were found in another study conducted by Manal Badrasawiet al.²⁰ the main reasons reported for skipping breakfast were not feeling hungry (59.7%), not having the time (50.4%), and not liking eating early (48.8%), not finding food ready to eat (19.4%), to lose weight (15.5%) and not liking food choices (14.7%). In another study conducted by Hazzaa M Al-Hazaa et al.¹⁴ the most common reasons for

skipping breakfast at home included not feeling hungry and waking up late for school.

In the current study, most liked food item reported by adolescents were snacks. Most liked snack among adolescents was burger. Most liked food items among females were cholebhature, burger and ice-cream. Most liked food items among males were burger, samosa and chicken. Least liked food items were green vegetables and milk. Similar results were found in another study conducted by Mukherjee Reema et al.¹²Snacks and fast foods were the most liked items (79.07%) and milk (72.36%) and green vegetables (20%) were the least liked items.

In the current study, majority of the adolescents consumed green vegetables more than once weekly, only 16.4% consumed it once or more than once daily and 16.9% consumed it once or less than once weekly. In another study conducted by Mukherjee Reema et al.¹²green vegetables were consumed by most of the children (52.9%) only once a week and only 4.5% of them consumed it daily. In another study conducted by Kotecha P.V. et al.¹⁵ nearly 80% of participants had green vegetables on previous day. In another study conducted by Shukla Nir pal et al.¹⁹ 51.1% of participants had green vegetables on previous day. In another study conducted by MeherSabita et al.²¹38% adolescents took green vegetables in their diet daily and 19.2% did not consume green vegetables or consumed them occasionally in the past week.

Present study found correlation between frequency of green vegetables consumption and socio-economic class of the participants ($p < 0.001$).

Lower consumption of green vegetables was seen among participants of lower socio-economic class. Contrary results were found in another study conducted by

OmidwarShabnam et al¹ higher consumption of green vegetables was seen among participants of lower socio-economic class. In their study 78.6% participants from lower SES class had daily consumption of vegetables.

In the current study, most of the adolescents consumed snacks more than once weekly, 28.7% consumed it once or more than once daily and 18.3% consumed it once or less than once weekly. In another study conducted by OmidwarShabnam et al¹ 68.7% participants had everyday consumption of snacks. In another study conducted by MeherSabita et al.²¹48% had fast food more than once a week; 32% did not have fast food/snacks in the past week.

There was correlation between frequency of snacks consumption and gender of the participants ($p < 0.001$) in the current study. Daily snacks consumption was more common among males (27.8%) as compared to females (19.5%). Contrary results were found in another study conducted by Gharib Nadia et al²⁹ daily consumption of sweets and snacks was significantly more common in girls (64.2%) than in boys (47.5%). In another study conducted by Rathi Neha et al³⁵no gender difference on consumption of snacks were observed.

There was correlation between frequency of snacks consumption and SES class of the participants ($p < 0.001$) in the current study. Higher consumption of snacks was seen among participants of higher socioeconomic class. In another study conducted by OmidwarShabnam et al¹ they found snacking was more frequent in participants from higher socioeconomic class (55.3%).

Present study found correlation between frequency of snacks consumption and BMI of the participants ($p < 0.001$). Participants with higher frequency of snacks consumption had significantly higher proportion of

overweight and obese adolescents. In another study conducted by OmidwarShabnam et al¹ highest frequency of snacking was seen in overweight and obese adolescents (62.1%). However statistically it was not significant. In another study conducted by Ming Li et al.²² on 1804 school going adolescents of Xi'an city of China aged 11-17 years, they also found higher prevalence of overweight and obesity among female participants in those consuming energy dense foods (OR: 1.7, 95% CI: 0.5-0.9). Contrary Similar results were found in another study conducted by Bena zeera et al²³ it was also found that there was no co-relation between eating habits and BMI ($r=-0.085$; $p < 0.05$).

Conclusion

This cross-sectional study conducted over 1000 adolescent children found that More than one-fourth adolescents were underweight (29.2%) while 13.9% adolescents were overweight or obese. Participants consuming mixed diet had significantly higher proportion of underweight and overweight or obese adolescents There was significant difference was seen in in triceps skin fold thickness (TSFT) among males and females in the age group 13-15 years and 16-19 years. Significant correlation between type of diet and socio-economic class was found Vegetarian diet was more common among participants from higher socio-economic class. Mixed diet was more common in participants from lower socio-economic class. Among meal skippers most common reason was not feeling hungry. Most liked food items among adolescent's male and females burger and cholebhature respectively

Recommendations

The present study recommends that Adolescent dietary habits should be monitored frequently by the family members and school authorities

they should be taught about the concepts of balanced diet from early phases of school education.

Dietary and nutrition assessment should become a part of all adolescent clinic visits. Consumption of fast food /junk food and soft drinks should be avoided among adolescents

References

1. Omidvar S, Begum K. Dietary pattern, food habits and preferences among adolescent and adult student girls from an urban area, South India. Indian Journal of Fundamental and Applied Life Sciences. 2014 Apr;4(2):465-73.
2. Paul V, Agarwal A, Lodha R. Nutrition. In: Paul V, Bagga A (Eds). GHAI Essential Pediatrics. 9th edition. New Delhi: CBS Publishers & distributors Pvt Ltd; 2019.
3. Elizabeth KS, Bind Usha S. Nutrient groups and nutritional requirements. In: Gupta P, Menon PSN, Ramji S, Lodha R (Eds). PG Textbook of Pediatrics. 2nd edition. New Delhi: JAYPEE Brothers Medical Publishers (P) Ltd; 2018.
4. "Healthy Diet." WHO, World Health Organisation, 29 Apr. 2020, [https://www.who.int/news-room/fact-sheets/detail/healthy-diet?](https://www.who.int/news-room/fact-sheets/detail/healthy-diet)
5. https://www.euro.who.int/__data/assets/pdf_file/0003/303438/HSBC-No.7-Growing-up-unequal-Full-Report.pdf
6. "Recognizing Adolescence." WHO, World Health Organisation, [https://apps.who.int/adolescent/second-decade/section2/page1/recognizing-adolescence.html?](https://apps.who.int/adolescent/second-decade/section2/page1/recognizing-adolescence.html)
7. "Adolescent Health in the South-East Asia Region." WHO, World Health Organisation, [https://www.who.int/southeastAsia/health-topics/adolescent-health.](https://www.who.int/southeastAsia/health-topics/adolescent-health)

8. "Adolescent Health." WHO, World Health Organisation, <https://www.who.int/health-topics/adolescent-health> tab=tab_1?
9. Glenn Thomas, WHO, World Health Organisation, 14 May 2014, <https://www.who.int/news/item/14-05-2014-who-calls-for-stronger-focus-on-adolescent-health>.
10. Aneja S, Singh P. Identification and classification of severe acute malnutrition. In: Kumar P, Gupta P (Eds). Severe Acute Malnutrition. 1st edition. New Delhi: CBS Publishers & distributors Pvt Ltd; 2017.
11. Gautam L, Gyawali A, Gaire J, Aryal R, Belbase D, Panthi MP. Association of dietary practice with body mass index among late adolescent and their health risk habits. *International Journal of Medical Science and Public Health*. 2019;8(9):706-11.
12. Mukherjee R, Chaturvedi S. A study of the dietary habits of school children in Pune city, Maharashtra, India. *International Journal of Community Medicine and Public Health*. 2017 Feb;4(2):593-7.
13. Ameer SR, Ahmad SR, Chandrasekhar A. Assessment of underweight and its determinants among school going adolescents in Hyderabad. *Indian J Public Health Res Dev*. 2018 May; 9:77-.
14. Al-Hazzaa HM, Al-Rasheedi AA, Alsulaimani RA, Jabri L. Anthropometric, Familial-and Lifestyle-Related Characteristics of School Children Skipping Breakfast in Jeddah, Saudi Arabia. *Nutrients*. 2020 Dec;12(12):3668.
15. Kotecha PV, Patel SV, Baxi RK, Mazumdar VS, Shobha M, Mehta KG, Mansi D, Ekta M. Dietary pattern of school going adolescents in urban Baroda, India. *Journal of health, population, and nutrition*. 2013 Dec;31(4):490.
16. Li M, Dibley MJ, Sib Britt DW, Yan H. Dietary habits and overweight/obesity in adolescents in Xi'an City, China. *Asia Pacific journal of clinical nutrition*. 2010 Mar;19(1):76-82.
17. Prasun B, Sujaya M, Payas J, Sahibjeet S. Food habits and obesity: a study in adolescents. *Int J Contemp Pediatr*. 2017;4(2):336-40.
18. Savage G, MacFarlane A, Ball K, Worsley A, Crawford D. Snacking behaviours of adolescents and their association with skipping meals. *International Journal of Behavioral Nutrition and Physical Activity*. 2007 Dec;4(1):1-9.
19. Shukla NK, Shukla M, Siraj Ahmad D, Shukla R. A Preliminary Study on Eating Habits among School Going Adolescent Girls in Barabanki District, Uttar Pradesh. *Hindu*.;260:77-4.
20. Badrasawi M, Anabtawi O, Al-Zain Y. Breakfast characteristics, perception, and reasons of skipping among 8th and 9th-grade students at governmental schools, Jenin governance, West Bank. *BMC nutrition*. 2021 Dec;7(1):1-0.
21. Meher S, Nimonkar R. Assessment of dietary pattern of school going adolescents in a metro city: A cross sectional study. *Int J Community Med Public Health*. 2018 Sep; 5:4043-8.
22. Li M, Dibley MJ, Sib Britt DW, Yan H. Dietary habits and overweight/obesity in adolescents in Xi'an City, China. *Asia Pacific journal of clinical nutrition*. 2010 Mar;19(1):76-82.
23. Bena zeera UJ. Association between eating habits and body mass index (BMI) of adolescents. *Int J Med Sci Public Health*. 2014 Aug 1; 3:940-3.