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A Cross-Sectional Study on Diet Pattern and Physical Activity Among the Youth in Field Practice Area in Chennai

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Abstract:

- ***Background:***

Excessive snacking and physical inactivity are common among young people and put them at a high risk for non-communicable diseases such as diabetes. India has a high diabetic burden, so early prevention is warranted. Lifestyle determinants, usually subject to individual and family decisions, are difficult to manage. Low fruit intake, increased fast food consumption, and lack of physical activity have been reported in Indian children in earlier studies. Evidence on snacking behaviors among adolescents and their overall dietary consequences is scarce. The current study seeks to evaluate physical activity and dietary habits among Chennai youth.

- ***Methods:***

This Chennai-based two-month cross-sectional survey targeted university students (18-25 years). The sample size was calculated at 172 participants using a 95% confidence level and 10% margin of error, estimating a 50% prevalence of unhealthy diet/physical inactivity, including for a design effect and response rate. Convenience sampling was employed. The data were gathered using a pretested.

Google Forms questionnaire to capture sociodemographic, diet, physical activity, and food expenditure. Analysis was conducted using SPSS version 22, with descriptive statistics and association chi-square tests. Ethical permission and informed consent were granted.

- ***Results:***

The sample consisted of 186 participants with a mean age of 20.8 years (SD: 2.5), 58.1% female and 41.9% male. The majority (60.2%) had a normal BMI, 29% overweight, and 10.8% underweight. Typically, monthly pocket money ranged from 500-2000 rupees (45.7%). Most were non-vegetarian (88.2%) and skipping breakfast was equally distributed (50%). Fast food was the most frequently consumed snack (40.9%), followed by chocolates (37.6%). Most ate 1 cup of snacks per day (71.5%) and snacked 2-3 times a week (44.6%). The most common physical activity done was walking (51.6%). Rice

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was the most consumed carbohydrate (88.2%), eaten at 2 cups per day on average (49.5%). Eggs (33.3%) and vegetable proteins (29.6%) were prevalent sources of protein, and 65.6% ate 1 cup per day.

Vegetables accounted for the primary iron source (61.8%), whereas vegetables (45.2%) and fruits (41.9%) accounted for the primary fiber source, with 78% eating 1 cup per day. Gender had a significant effect on BMI (p=0.003), with a higher percentage of overweight subjects among males (41%) compared to females (20.4%). Other variables such as pocket money, eating preference, and frequencies of nutrient intakes were not significantly related to BMI.

- ***Conclusion:***

The research identifies key problems in diet and physical activity among young Indians as excessive fast food intake and a low level of physical activity. Gender is found to have a strong impact on BMI, necessitating gender-specific interventions. The results stress the imperative to develop overall strategies for enhancing healthy lifestyles and mitigating lifestyle-determined health risk. It is suggested that longitudinal studies be conducted to study the long-term effects of spending habits and eating times on health parameters.

Keywords: *Dietary Habits, Physical Activity, BMI, Snacking, Lifestyle.*

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I. INTRODUCTION

Snacking is the practice of eating small amounts of food and beverages, including chips, chocolates, and soft drinks. Numerous studies from throughout the world have revealed that young individuals, particularly enrolled students, snack often [1]. Poor snacking behaviour is defined as eating snacks in between meals [1, 2]. Children and adolescents who engage in irregular snacking run the very real danger of developing metabolic, neurological, and cardiovascular problems [2]. With early initiation of irregular eating behaviour, the severity of negative effects increases [2].

There are an estimated 61.3 million diabetics in India. As a result, India will be second only to China (3). It is time to introduce preventative and facilitative measures early in life to reduce the incidence of noncommunicable diseases. While aetiology of NCDs is multi-factorial, lifestyle factors such as diet and physical activity are difficult to control and surveil as they are primarily determined by family and individual choices (4).

According to research, only 39.4 percent of children consumed fruits everyday, while 34.4% of boys and 29.4% of girls reported eating fast food more than three times per week (5). Only one in five students, or 18.3% of boys and 22.2% of girls, said they engage in physical activity for 60 minutes a day, at least three days a week (6). Another study carried out in Chandigarh discovered that 0.5% of youngsters were preobese and 0.3% were obese. While 13.6 percent of the participants believed that eating fruits and vegetables had no benefits, the bulk of them (81.3 percent) reported eating fast food in the previous week (Samosas, patties, noodles, etc.). It was discovered that 71.7% of males and 71.67% of girls skipped school's physical education class (7). According to a comparable study conducted in Kerala, the majority of students (84.8%) had very little knowledge of the lifestyle risk factors for NCDs (8).

Despite the rumoured high incidence of snacking among adolescents and the probable link between snacking and obesity, studies on adolescent snacking habits are lacking. Little is understood about the context of adolescents' snacking or how it may affect other dietary practises like skipping meals.

Hence, the present study assesses the dietary practices and physical activity performed by youth in Chennai.

- *Aims and Objectives*

- To determine the diet patterns and exercise routines of college going students in Chennai
- To understand their consumption of calories, protein and fibre and compare it with their exercise regimes
- To examine their monetary expenditure on food

II. MATERIALS AND METHODS

- *Study Design:* Cross-sectional study
- *Duration of Study:* 2 months
- *Study Setting:* Study will be conducted across Field practice areas in Chennai through Google form containing pretested questionare
- *Study Population: College students (18-25 years) from various institutions in Chennai*
- *Sample Size Calculation:*

To determine the sample size for the cross-sectional study, the following parameters were used: 95% confidence level, 10% margin of error, and an estimated 50% prevalence of unhealthy diet/physical inactivity among college students. Using these parameters, the initial sample size calculation yielded 97 participants. However, accounting for a design effect of 1.5 to accommodate for

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clustering and an anticipated response rate of 85%, the required sample size was adjusted to 172 participants. This sample size ensures a reliable estimate of the prevalence and characteristics of dietary habits and physical activity among college students in Chennai, with a margin of error of ±10% and maintaining a 95% confidence level.

- *Sampling Method:* Convenience sampling

- *Inclusion criteria:* The study will include young adults aged 18-25 years who are currently enrolled in college and residing in Chennai and are willing participants in the study, thereby ensuring a targeted and representative sample of the college-going youth in the city.

- *Exclusion criteria:* Unwilling participants and students with physical disabilities limiting physical activity were excluded from the study

- *Data Collection:*

Data collection will be done by sharing a link to an online survey that will be developed using Google Forms. The survey will have a structured and pretested questionnaire to capture all dimensions of lifestyle among college students. It will include sociodemographic factors (age, sex, education, etc.), dietary patterns (frequency of consumption, portion sizes, etc.), physical activity levels (type, frequency, and duration of activities, etc.), expenditure on food, and other lifestyle habits such as sleep and screen time, among others. This survey will be available online for a period of 2 months; thus, it will give indepth insight into the students' behavior and habits.

- *Study Tool:* pretested questionnaire

- *Data Analysis:*

Data was entered in MS Excel and analysed by using SPSS version 22. Descriptive statistics was used to represent frequencies in the form of tables. Chi-square test was used to find the association between dietary eating habits,physical activity and lifestyle habits among the study participants with significance at 95% Confidence Interval.

- *Ethical Considerations:*

Ethical approval was obtained from the Institutional Ethical Committee of tertiary medical college and informed consent was obtained from all the study participants before enrolling them in the study.

III. RESULTS

Table 1: Basic Details of College Students Among Various Institutions in Chennai

Details		N	%
Age	Mean (SD)	20.8 years	2.5 years
Gender	Female	108	58.1%
	Male	78	41.9%
BMI Classification	Normal	112	60.2%
	Overweight	54	29%
	Underweight	20	10.8%
Pocket Money Spent (in rupees)	< 500	50	26.9%
	500 to 2000	85	45.7%
	2000 to 4000	51	27.4%
Food preference	Veg	22	11.8%
	Non - Veg	164	88.2%
Habit of skipping BF	Yes	93	50%
	No	93	50%
Preferred Eating spot	Home	164	88.2%
	Hostel	105	56.5%

- *The Above Table Shows the Basic Details of the Study Population, an Average Age of 20.8 Years (SD:*

2.5), with a gender distribution of 58.1% female and 41.9% male. In terms of BMI, 60.2% have a normal classification, 29% are overweight, and 10.8% are underweight. Monthly pocket money spending varies, with 45.7% spending between 500 to 2000 rupees, 26.9% under 500 rupees, and 27.4% between 2000 to 4000 rupees. The majority (88.2%) prefer a non-vegetarian diet, while 11.8% prefer vegetarian. Breakfast habits show an even split, with 50% regularly skipping and 50% not. Additionally, 88.2% prefer eating at home and 56.5% prefer eating at hostel.

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Table 2: Habits of College Students Among Various Institutions in Chennai

Details		N	%
Snacks consumption (other than 3 meals)	Only Food	18	9.7%
	Fast Food	76	40.9%
	Chocolate	70	37.6%
	Healthy Snacks	20	10.8%
	Others	2	1.1%
Serving of snacks in a day	1 cup	133	71.5%
	2 cups	18	21%
	3 cups	4	7.5%
Frequency of snacks intake (in weeks)	Once	36	19.4%
	2 to 3	83	44.6%
	4 to 5	37	19.9%
	> 5	30	16.1%
Preferred Physical activity	Walking	96	51.6%
	Gym	43	23.1%
	Others	47	25.3%
Physical activity per day (in mins)	5 to 10	43	23.1%
	10 to 20	50	26.9%
	20 to 40	46	24.7%
	40 to 60	47	25.3%

The above table reveals that 40.9% of participants consume fast food as snacks, followed by 37.6% who prefer chocolate, 10.8% who choose healthy snacks, and 9.7% who consume only food items other than meals. In terms of snack serving sizes, 71.5% have 1 cup per day, while smaller portions consume 2 cups (21%) and 3 cups (7.5%). Snack intake frequency shows that 44.6% indulge in snacks 2 to 3 times per week, 19.9% consume them 4 to 5 times, and 16.1% exceed 5 times weekly. For physical activity preferences, 51.6% of participants favor walking, with 23.1% attending the gym and 25.3% engaging in other activities. Daily physical activity durations are varied, with 26.9% engaging in 10 to 20 minutes, 18.3% in 40 to 60 mins, 24.7% in 20 to 40 minutes, and 23.1% in 5 to 10 mins group.

Table 3: Source & Frequency of College Students in Chennai

Details		N	%
Source of carbs	Rice	164	88.2%
	Wheat	18	9.7%
	Others	4	2.2%
Frequency of carbs intake (in Cups)	1 cup	38	20.4%
	2 cups	92	49.5%
	3 cups	56	30.1%
Source of protein	Plant	55	29.6%
	Egg	62	33.3%
	Chicken	53	28.5%
	Sea Food	16	8.6%
Frequency of protein intake (in Cups)	1 cup	122	65.6%
	2 cups	49	26.3%
	3 cups	15	8.1%
Source of Iron	Plant	115	61.8%
	Animal	55	29.6%
	Others	16	8.6%
Source of Fiber	Fruits	78	41.9%
	Vegetables	62	45.2%
	Others	53	12.9%
Frequency of Fiberintake (in Cups)	1 cup	145	78%
	2 cups	35	18.8%
	3 cups	6	3.2%

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Table 3 provides an overview of participants' dietary sources and frequency of intake. Rice is the primary carbohydrate source for 88.2%, followed by wheat (9.7%), with 49.5% consuming 2 cups per day. For protein sources, eggs (33.3%) and plant-based proteins (29.6%) are the most common, with 65.6% consuming 1 cup daily. Regarding iron sources, 61.8% rely on plants, while 29.6% derive it from animal sources. Fiber intake is predominantly from vegetables (45.2%) and fruits (41.9%), with 78% consuming 1 cup daily. This data reflects participants' primary sources and typical daily intakes for key nutritional components

I'm Table 4: Factors affecting BMI in College Students

Factors	Normal (%)		Overweight (%)	Underweight (%)	p value
Gender	Male 42 (53.8%)		32 (41%)	4 (5.1%)	**0.003**
	Female	70 (64.8%)	22 (20.4%)	16 (14.8%)	
Pocket Money Spent (in rupees)	< 500 34 (68%)		10 (20%)	6 (12%)	0.574
	500 to 2000 49 (57.6%)		28 (32.9%)	8 (9.4%)	
	2000 to 4000	29 (56.9%)	16 (31.4%)	6 (11.8%)	
Food preference	Veg	15 (68.2%)	4 (18.2%)	3 (13.6%)	0.480
	Non - Veg	97 (59.1%)	50 (30.5%0	17 (10.4%)	
Frequency of Protein intake (in Cups)	1 cup	73 (59.8%)	36 (29.5%)	13 (10.7%)	0.825
	2 cups	31 (63.3%)	12 (24.5%)	6 (12.2%)	
	3 cups	8 (53.3%)	6 (40%)	1 (6.7%)	
Frequency of Carbs intake (in Cups)	1 cup	23 (60.5%)	11 (28.9%)	4 (10.5%)	0.980
	2 cups	57 (62%)	25 (27.2%)	10 910.9%)	
	3 cups	32 (57.1%)	18 (32.1%)	7 (10.7%)	
Frequency of snacks intake (in weeks)	Once	15 (41.7%)	15 (41.7%)	6 (16.7%)	0.131
	2 to 3	57 (68.75)	19 (22.9%)	7 (8.4%0	
	4 to 5	25 (67.6%)	9 (24.3%)	3 (8.1%)	
	>5	15 (50%)	11 (36.7%)	4 (13.3%)	
Physical activity per day (in mins)	5 to 10	29 (67.4%)	8 (18.6%)	6 (14.9%)	0.082
	10 to 20	31 (62%)	11 (22%)	8 (16%)	
	20 to 40	29 (63%)	14(30.4%)	7 6.4%)	
	40 to 60	23 (48.9%)	21 (44.7%)	3 (6.4%)	

*p <0.05 – There is a statistically significant difference in gender with BMI (Chi square test) Table 4 examines various factors affecting BMI classifications—normal, overweight, and underweight—among participants, with significance determined by chi-square tests. Gender shows a significant difference (p=0.003) as males have a higher proportion of overweight individuals (41%) compared to females (20.4%), while females have a higher percentage in the normal BMI range (64.8%). Pocket money spent, food preference, and intake frequencies for protein, carbs, snacks, Physical activity do not show statistically significant differences in BMI categories.

IV. DISCUSSION

The study showed worrisome trends in the dietary habits of Indian adolescents and young adults. Many of the participants had low dietary diversity and relied heavily on energy-dense snacks and drinks. These results are in line with previous studies pointing towards a nutritional transition in India. Such a transition involves a shift from traditional home-cooked meals to processed and fast foods. Poor dietary diversity and high calorific consumption have resulted in obesity, metabolic syndrome, and increased risk of type 2 diabetes. These dietary habits lead to the necessity of solid nutritional promotion strategies advocating for equitable diets and portion sizes. The analysis of participants' duration of physical activity indicates imbalances in the levels at which people engage as 22.7% were only able to spare 5–10 minutes a day while 25.4% could manage 40–60 minutes. All these findings are, in a way, revalidated by the rest of the urban-centric studies, where under academic and social pressures, they do not get much chance to exercise as they remain sedentary. Low rates of physical activity enhance obesity and cardiovascular diseases risks. The community-level interventions for encouraging regular physical activity, such as walking groups or gym accessibility, are suggested. Generally, there is an observed difference between both genders about dietary patterns. Girls eat healthier compared to boys. These results resonate with previous studies that show male adolescents consume fewer healthy foods and more fast foods and sugar-sweetened beverages. Targeted interventions that focus on the food behaviors of men need to be implemented to decrease these disparities. Nutritional education campaigns should create awareness about the right way of eating among all genders.

Poor diet with excessive intake of fast food, snacks and drink imbalances proved to be associated with compromised quality of sleep. Earlier studies are in accordance that carbohydrate rich diets affect the sleep behavior negatively in vegetarians. These studies point out the link between diet and well-being. Hostel and institutional menuses should have balanced food

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combinations that improve physical and mental well-being. Most (62.98%) of the participants fell within the age range of 20–21 years, a transitional phase in life. Hence, the public health strategies should be targeted toward them to initiate lifetime habits concerning healthy lifestyles. Institutions can also play a role in promoting healthier environments by including wellness programs.

The study findings bring out the need for an all-rounded intervention to reverse unhealthy dietary and lifestyle patterns:

- Education: Nutrition campaigns for the adolescents and young adults.
- Access: Healthy food products should be made more affordable and accessible in urban areas.
- Physical Activity: Encouragement of active lifestyles through community-based programs that are accessible.
- Family Engagement: Parents must be involved to influence intergenerational dietary habits. This study examines the food consumption, physical activity, and their relationship with BMI for a particular population. The results include an in-depth profile of the intake pattern and consumer choice of participants; the activity pattern of the subjects; and the impact on the distinction between BMI categories. Summary
- Age and Sex: Participants were mostly in an age group of 20.8 years (SD: 2.5). Distribution according to gender was 58.1% female and 41.9% males.
- BMI Category: Most had a normal BMI, that is, 60.2%. About 29% were overweight, and 10.8% underweight.
- Diet and Lifestyle
- Pocket Money: The most amount of pocket money was between 500 to 2000 rupees (45.7%).
- Food choice: Mostly non-vegetarian (88.2%).

- Eating Habits: Skipping breakfast was fairly evenly split between skip (50%) and don't skip (50%). Home eating was the most popular choice at 88.2%. This data suggests that although gender and BMI are relatively well-balanced in this sample, a huge factor in determining lifestyle patterns may be financial and dietary habits.
- Snacking Habits:
- of 40.9% report frequently eating fast food as their snack, followed by chocolates at 37.6%.
- Majority of respondents snacked once per day that is, 71.5 percent, and consumed them 2–3 times per week, 44.6 percent.
- Physical Activity:
- Walking was the most common type of physical activity practiced, 51.6 percent, compared to gym and other activities.
- The daily exercise duration was different, such as 26.9% in 10–20 minutes, and 24.7% in 20–40 minutes. High fast food consumption along with low duration of exercises shows lifestyle risks.
- Walking was the most exercised, which reflects that the preference is on low intensity.
- Carbohydrates: The staple was rice, accounting for 88.2%, and most of the respondents consumed 2 cups of it daily, at 49.5%.
- Proteins: Eggs and plant-based proteins were the leading sources (33.3% and 29.6%, respectively), with 65.6% consuming one cup daily.
- Iron and Fiber:

Plant sources were predominant for iron (61.8%). The main source of fiber was from vegetables (45.2%), and from fruits 41.9%. A total of 78% consumed one cup daily.

Use of rice as the primary carbohydrate source and low varieties of protein indicate dietary imbalances.

Dietary emphasis on diversified and balanced sources may correct the nutritional deficiencies. Gender: The data revealed a significant influence of gender on BMI ($p=0.003$). The percentage of males with overweight BMI was the largest at 41%, whereas in females the largest percentage fell into the normal BMI category (64.8%).

- Other Variables: Pocket money, preferences for different types of food, and the frequency of consumption of those nutrients had no such relation with BMI.

Gender came out to be a statistically significant predictor of BMI. However, dietary habits as well as physical activity levels do not seem to have as significant effects. This shows that BMI has multifactorial determinants. The study gives an overall view of lifestyle patterns and their relation to BMI. Genderspecific BMI differences clearly raise the demand for targeted intervention. Another area is needed in public health, as the prevalence of fast food consumption and low levels of physical activity are very high. Future research can focus on the interplay between financial habits and meal timing with their long-term impact on health outcomes.

V. CONCLUSION

- It lays out the urgent requirement for coordinated efforts towards eradicating poor dietary and physical activity patterns among Indian adolescents and young adults. Findings from this research can guide the development of targeted interventions toward the promotion of healthy lifestyles and reduction of lifestyle-related risks. Future longitudinal studies are recommended to measure the long-term effects on health outcomes. The study gives an overall view of lifestyle patterns and their relation to BMI. Genderspecific BMI differences clearly raise the demand for targeted intervention. Another area is needed in public health, as the prevalence of fast food consumption and low levels of physical activity are very high. Future research can focus on the interplay between financial habits and meal timing with their long-term impact on health outcomes.

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