

## ORIGINAL ARTICLE

**Pattern of Fast Food and Sugar-Sweetened Beverages Consumption among Students of Lahore Medical and Dental College, Lahore**Saadia Maqbool<sup>1</sup>, Seema Daud, Khawaja Allah Ditta Saad, Mehr Salman Ahmad, Beya Idrees, Kainat Ejaz**ABSTRACT**

**Objective:** To assess fast food and sugar-sweetened beverages consumption patterns among medical students along with associated factors and to determine the association between intake of these items and body mass index.

**Study Design:** Cross-sectional study.

**Place and Duration of Study:** This study was conducted at the Department of Community Medicine, Lahore Medical and Dental College, Lahore, Pakistan from May 2023 to September 2023.

**Methods:** A convenience sampling technique was used to recruit 146 MBBS students. Using a structured questionnaire, information was obtained on the background of participants, fast food and sugar-sweetened beverages consumption, and their body mass index. Chi-square test was applied to find an association between variables with  $p \leq 0.05$  taken as significant.

**Results:** The study included 60% females and 52% boarders. Mothers of 6% of students and fathers of 12% of students were doctors. The mean body mass index was  $22.43 \pm 3.51$ . Frequent consumption of fast food was 36% and of sugar-sweetened beverages was 12%. The most frequently consumed items were salty snacks (77%) and regular soda (67%). A significant relationship was found between fast food consumption with residence, the mother's profession, and awareness about nutritional information. Consumption of sugar-sweetened beverages was significantly related to gender and knowledge about the harmful effects of these beverages. The body mass index of students significantly increased with an increase in the use of sugar-sweetened beverages and was inversely associated with fast food consumption.

**Conclusion:** Consumption of fast food and sugar-sweetened beverages was high among study participants. Salty snacks and soda drinks were frequently consumed items. There is an immediate need for national policies and strategies to create a healthy dietary environment among students.

**Keywords:** Consumption, Fast Food, Pattern, Students, Sweetened Beverages.

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**Introduction**

Globally, young adults are increasingly embracing westernized diets that prioritize fast food (FF) and

sugar-sweetened beverages (SSBs), posing significant challenges to public health.<sup>1,2</sup> Fast food, known for convenience and rapid preparation, is very popular among adolescents and young adults. Simultaneously, SSBs have become a prominent source of added sugar and calories, particularly among youth.<sup>3</sup>

Frequent fast-food consumption is linked to poor nutrient intake, high calories, and glycemic load.<sup>4</sup> Fast food is often prepared in reused oil, which results in levels of aldehydes over what the World Health

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Organization considers safe.<sup>5</sup> High-glycemic sugar-sweetened drinks lead to quick blood sugar spikes and lower insulin sensitivity, raising the risks of obesity, central fat accumulation, and future heart diseases, diabetes, and hypertension.<sup>6,7</sup> Studies have linked fast food and sugary drinks to dental problems, weight gain, type 2 diabetes, dyslipidemia, and fatty liver disease.<sup>8</sup>

This rising trend of fast food and SSB intake stems from factors like high income, urbanization, enticing advertising, global cuisine access, and home deliveries.<sup>9</sup> Globally, SSB per capita consumption is rising in middle-income countries.<sup>10</sup> In Bangladesh, 55.9% of males, and 44.1% of females consumed fast food.<sup>8</sup> Over the past few decades, a drift from traditional meals to increased fast food and sugar-sweetened beverage consumption along with a decrease in fruit and vegetable intake was observed. In Pakistan, a study revealed that 62% of males and 50.5% of females consumed fast food weekly, the highest being in the age group of 18-40 years in both genders.<sup>11</sup> In 2014-2016, carbonated beverage consumption was found in 37.7% of households in Pakistan.<sup>12</sup> A study conducted among medical students of Pakistan revealed that about 63% of students consumed fast food once or twice a week and 21.8% took fast food daily. About 7.7% of students reported intake of soda drinks more than once per day.<sup>13</sup>

College students are particularly prone to making poor dietary choices due to convenient access to fast food and sweet beverages at campus, as well as the influence of their peers. These behaviors established during college can leave a lasting impact on their lifelong eating habits. There is a paucity of data about the consumption of fast food and SSBs among medical students of Pakistan. Neither the National Nutritional Survey 2018 nor the data of the Pakistan Bureau of Statistics assessed the food consumption pattern of Pakistani youth. This lack of evidence is a significant barrier to the planning of prevention measures for diseases arising due to consumption of fast food and SSB. This study aimed to determine the pattern of fast food and sugar-sweetened beverage consumption among medical students along with associated factors like gender, current residence, occupation of parents, the habit of reading

nutritional information on packaging, and knowledge about harmful effects of FF and SSB. The second objective was to find out the association between consumption of fast food and sweetened beverages and Body Mass Index (BMI).

## Methods

A cross-sectional study was carried out at the Department of Community Medicine, Lahore Medical and Dental College (LMDC), Lahore, Pakistan from May 2023 to September 2023. Ethical approval was granted by the Institutional Review Board of the College vide reference no: LMDC/13370/23 held on 1<sup>st</sup> July 2023. Sample size was calculated by the Raosoft sample size calculator keeping the confidence level at 95%, margin of error at 5%, and prevalence at 92%.<sup>4</sup> Using a convenience sampling technique, 146 fourth-year MBBS students were included in the study. A structured questionnaire was used consisting of three sections. The first section contained the background information of the study participants like gender, age, area of permanent residence, current residence, pre-medical qualification, parents' profession, weight, height, and body mass index (BMI). The second section had questions regarding fast food and SSB consumption. The third part consisted of a standardized tool called the Beverages Snacks Questionnaire (BSQ). The BSQ inquired about the frequency of consumption of fast food, both inside and outside the academic institution.

The Statistical Package for Social Sciences (SPSS) version 23, was used for data entry, cleaning, and analysis. For categorical variables, descriptive statistics such as frequency and proportions were used; for continuous variables such as age and body mass index, mean and standard deviations were calculated. To find the association between variables, Chi-square test/Fischer exact test were used. The  $p$ -value  $\leq 0.05$  was taken as a significant association.

## Results

### Background information of students

The present study included 60% females and 52% boarders. Pre-medical qualification of 77% of students was in the faculty of sciences (F.Sc). Mothers of 6% of students and fathers of 12% of students were doctors. (Table-1) (n=146). The mean

**Table -1: Sociodemographic profile of study participants**

Socio-demographic information	Frequency (n)	Percentage (%)
<b>Gender</b>		
Female	88	60.3
Male	58	39.7
<b>Current residence</b>		
Home	70	47.9
Hostel	76	52.1
<b>Pre-medical qualification</b>		
F.Sc	112	76.7
A level	33	22.6
American board	1	0.7
<b>Profession of Father</b>		
Doctor	17	11.6
Non-doctor	129	88.4
<b>Profession of Mother</b>		
Doctor	8	5.5
Non-doctor	138	94.5

**BMI of students**

The mean BMI was  $22.43 \pm 3.51$ . About 68% of students had a normal BMI while 23% were overweight.

Among the study respondents, 59% used to eat fast food at dinner time. Most of the respondents (68%) consumed medium portion size of food. Fast food points were the most popular place for consumption of fast food by students (53%). The most common reason for choosing to eat fast food was liking its taste (85%). Only 4% of students always checked for nutritional information & ingredients of each of the fast foods they consumed. About 95% of respondents knew that fast food and SSB consumption has harmful effects on health. (Table-2) (n=146).

**Frequency of SSBs and fast food consumption**

In the present study, those students who consumed fast food or SSBs at least 2-4 times per week were labeled as frequent consumers and those who had such food less than 2 times per week were taken as infrequent users. Overall, 53(36%) respondents were frequent consumers of fast food and 17(12%) were frequent consumers of SSB.

**Determinants of fast food and SSB consumption in students**

As seen in Table-3 (n=146), a statistically significant

relationship was noted between high consumption of fast food and hostel residence ( $p=0.02$ ), non-doctor mothers ( $p=0.02$ ), and among those who do not read nutritional information on food packages ( $p=0.03$ ). A statistically significant association was found between frequent consumption of SSBs in male students ( $p=0.006$ ) gender and among those who did not have awareness about the harmful effects of SSB on health ( $p=0.02$ ).

**Association of BMI with fast food consumption in students**

As seen in Figure.1, BMI of study participants was inversely associated with fast food consumption. Infrequent consumers of fast food had a mean BMI of 23.1, while frequent consumers had a mean BMI equal to 21.2. As BMI decreased, the frequency of fast food increased among the students. This was a statistically significant difference ( $p=0.02$ ).

**Association of BMI with SSBs consumption in students**

A statistically significant association was present between SSBs consumption and body mass index ( $p$  value= 0.04). Among 129 infrequent users, 11(9%) were underweight, 92(71%) had normal BMI and 26(20%) were overweight. While among 17 frequent users, 3(18%) were underweight, 7(41%) had normal BMI and 7(41%) were overweight.

**Table-2: Pattern of consumption of fast food among study participants**

<b>Pattern of consumption</b>	<b>n</b>	<b>%</b>
<b>Meals typically eaten at fast food points</b>		
Lunch	35	24
Dinner	86	58.9
Snacks	12	8.2
Multiple	13	8.9
<b>Portion size participants usually eat</b>		
Small	24	16.4
Medium	99	67.8
Large	23	15.8
<b>Places of consumption of fast food*</b>		
Home	65	44.5
College canteen	63	43.1
Fast food points	78	53.4
Restaurants	73	50
Road side vendor	15	10.2
<b>Reasons for choosing to eat fast food</b>		
Advertisement	2	1.4
Like the taste	124	84.9
Limited time for a proper meal	5	3.4
Variety of menu	15	10.3
<b>Awareness of nutritional information &amp; ingredients of fast food</b>		
Not at all	16	11
Rarely	32	21.9
Sometimes	66	45.2
Most of the time	26	17.8
Always	6	4.1
<b>Fast food and SSB consumption have harmful effects on health</b>		
Yes	138	94.5
No	8	5.5

\*Multiple options could be selected by participants

## Discussion

The present study was the first one conducted in the region assessing fast food and sugar-sweetened beverages consumption among undergraduate medical students.

The findings of the study revealed that 36% of respondents were frequent consumers of fast food as they were consuming fast food two or more two times a week. According to similar findings from another study (2022) carried out in Bangladesh,

30.5% of participants ate fast food one to three times per week.<sup>14</sup>

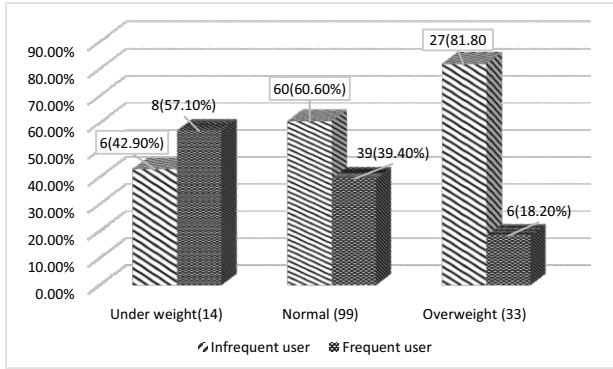
According to 77% of respondents in the current study, salty snacks were the most often consumed. Another study conducted by Kazi et al. (2020) among Saudi Arabian students, concluded that the most popular foods were chips and French fries (58%).<sup>15</sup> The variations in study setting and geographic locations may be the cause of the disparities in dietary preferences.

**Table-3: Determinants of fast food and SSB consumption in study participants**

Variables	Total	Fast food		p-value	SSB		p-value
		Infrequent consumer	Frequent consumer		Infrequent consumer	Frequent consumer	
<b>Gender</b>							
Female	88	54(61.3)	34(38.6)	0.47	83(94.3)	5(5.7)	0.006
Male	58	39(67.2)	19(32.8)	-	46(79.3)	12(20.7)	
<b>Current residence</b>							
Home	70	51(72.9)	19(27.1)	0.02	63(90)	7(10)	0.55
Hostel	76	42(55.2)	34(44.7)	-	66(86.8)	10(13.2)	-
<b>Father's profession</b>							
Doctor	17	11(64.7)	6(35.3)	0.92	15(88.2)	2(11.8)	0.98
Non doctor	129	82(63.6)	47(36.4)	-	114(88.4)	15(11.6)	-
<b>Mother's profession</b>							
Doctor	8	8(100)	0(0)	0.02	8(100)	0	0.29
Non doctor	138	85(61.6)	53(38.4)	-	121(87.7)	17(12.3)	-
<b>Fast food typically eaten during</b>							
Lunch	35	29(82.6)	6(17.1)	0.001	30(85.7)	5(14.3)	0.56
Dinner	86	55(64)	31(36)	-	78(90.7)	8(9.3)	-
Multiple meals or Snacks	25	9(36)	16(64)	-	21(84)	4(16)	-
<b>The habit of reading nutritional information on the packaging</b>							
Not at all	16	5(31.2)	11(68.8)	0.03	11(68.8)	5(31.2)	0.06
Rarely	32	19(59.3)	13(40.6)	-	28(87.5)	4(12.5)	-
Sometimes	66	47(71.2)	19(28.8)	-	62(93.9)	4(6.1)	-
Most of the times	26	17(65.3)	9(34.6)	-	22(84.6)	4(15.4)	-
Always	6	5(83.3)	1(16.7)	-	6(100)	0	-
<b>Knowledge about the harmful effects of FF and SSB</b>							
Yes	138	90(65.2)	48(34.7)	0.11	124(89.9)	14(10.1)	0.02
No	8	3(37.5)	5(62.5)	-	5(62.5)	3(37.5)	-

About 85% of participants in this study stated that they consumed fast food because they liked the taste, which was similar to the results of a study (2017) conducted in southwest Iran, among the adult

population where nearly 80% of respondents stated that their primary motivation for consuming fast food was its taste.<sup>16</sup> Place of residence may play a role in dietary choices.



**Fig.1: BMI and fast-food consumption in study participants (n=146)**

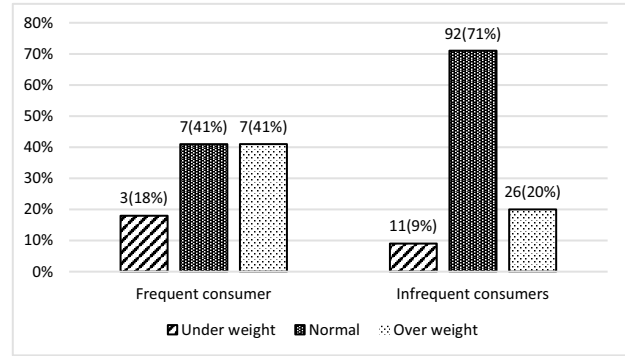
The present study revealed that about 45% of hostel residents were frequent consumers of fast food. This finding is in accordance with a previous study (2015) which stated that more than 50% of the students, consumed fast foods while residing in a hostel.<sup>17</sup>

Parents create environments for young ones that may foster the development of healthy eating habits. Mother's occupation played an important role in avoiding fast food consumption. Among our study participants, those who had doctor mothers were infrequent consumers of fast food. Yabancı et al. described in their research (2014) that mothers who have a higher level of awareness about nutrition, give their children more legumes, fruits, vegetables, and fewer fast foods and artificially sweetened drinks in comparison with mothers who have a lower level of nutritional knowledge.<sup>18</sup>

A significant association was observed between fast food consumption and not reading nutritional facts and ingredients on food packaging. In our study, about 11% of participants never read the nutritional information or ingredients of the packaging of fast food, and 22% used to read rarely. Another research conducted in Saudi Arabia (2017) described that 56% participants did not read the information about nutritional facts at fast food outlets.<sup>19</sup>

The current study showed that more than 90% of respondents were aware of the harmful effects of the consumption of fast food. In a comparable study (2020) conducted among Malaysian undergraduate students, 86% of study participants agreed that fast food is unhealthy and contributes to obesity and other health problems.<sup>20</sup>

According to the current study, 12% of students consumed SSB often (2-4 times per week or more). In



**Fig.2: BMI and consumption of SSBs in study participants (n=146)**

a multi-ethnic study conducted in Saudi Arabia, AlTamimi et al. (2023) examined the use of sugar-sweetened beverages among young men from a variety of ethnic backgrounds. The survey findings indicate that 94% and 41% of individuals used sugar-sweetened beverages on a weekly and daily basis, respectively. Bangladeshi individuals had the lowest rates of weekly consumption (77%) and daily consumption (7%), whereas subjects from the Philippines and Yemen had the greatest rates of weekly consumption (99%) and daily consumption (64%).<sup>21</sup>

In our study, regular soda was the most popular drink among students, mostly consumed outside the campus. A study conducted in Bahrain in 2020 indicated that about 55% of students consumed regular soft drinks.<sup>22</sup> Results of another study conducted among students at Alexandria University Egypt in 2019, showed that about 49% of students consumed cola drinks.<sup>23</sup>

Male gender was significantly associated with frequent consumption of SSBs. According to a study (2020) conducted among the Australian population, males consumed carbonated and non-carbonated SSBs more often than females.<sup>24</sup>

In the current study, those who knew less about the negative effects of sugar-sweetened beverages (SSBs) reported using them frequently. There was statistical significance in this relationship. Another study done in the United States in 2023 also showed that adolescents who did not know about the negative effects of SSB use, such as weight gain, heart disease, or certain malignancies, were substantially more likely to drink SSB  $\geq 1$  time per day.<sup>25</sup>

The current study showed that 41% of frequent consumers of SSBs were overweight as compared to 20% of infrequent consumers. This finding is consistent with the findings of the study conducted by Banik et al. (2020) showed that frequent consumption of SSBs leads to obesity.<sup>26</sup>

In the present study, contrary to expectations, regular consumption of fast food was negatively related to body mass index. Only 11% of frequent consumers of fast food were overweight while 29% of infrequent consumers had BMI above the normal range. This association was statistically significant. According to another study (2020) conducted among young populations in 54 low- and middle-income countries, BMI was found to be negatively correlated with fast-food consumption.<sup>1</sup> Findings of our study revealed that infrequent consumers of fast food have a higher mean BMI (23.1) while frequent consumers have a lower mean BMI (21.2). Another multi-center, multi-country study from 2014 found similar results, indicating that adolescents' self-reported frequent fast-food consumption was linked to a lower BMI.<sup>27</sup> However many studies indicated that frequent consumption of fast foods leads to overweight or obesity.<sup>6,13,28</sup>

### Limitations

Self-reported data will inevitably contain information bias. A cross-sectional study design makes it impossible to establish causal correlations. This study was conducted among students of only one class of a private medical college, which limits the generalizability of its results.

### Conclusion

Consumption of fast food and SSB was frequent among study participants. Salty snacks, ice cream, milkshakes, and soda drinks were frequently consumed items. A significant relationship was found between fast food consumption with residence, the mother's profession, and awareness about nutritional information. Consumption of sugar-sweetened beverages was significantly related to gender and knowledge about harmful effects of these beverages. There is an immediate need for regulations, strategies and recommendations to create a healthy eating environment in the nation.

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**Authors Contribution**

**SM:** Idea conception, study designing, data analysis, results and interpretation, manuscript writing, and proofreading

**SD:** Data analysis, results and interpretation, manuscript writing, and proofreading

**KADS:** Data collection, manuscript writing, and proof reading

**MSA:** Data collection and manuscript writing

**BI:** Data collection and manuscript writing

**KE:** Data collection and manuscript writing

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