

THE IMPACT OF EATING HABITS ON THE ACADEMIC PERFORMANCE OF MEDICAL STUDENTS

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Abstract

Background: Medical profession is the most demanding educational program both emotionally and academically so healthy diet is important for the future healthcare providers and they need to promote healthy dietary habits among their patients.

Objective. This study aimed to observe the impact of eating habits on academic grades of medical students.

Material and Methods. This cross-sectional study was carried out at Fazaia Ruth Pfau Medical College, Karachi from February to May 2024, within the duration of 3 months. In total 298 medical students were enrolled. Following ethical clearance and consent, information regarding demographic profile, dietary habits and academic performance was collected using a self-administered questionnaire via online Google Forms.

Results: A total of 298 medical students at Fazaia Ruth Pfau Medical University were enrolled in the study, of which 129 (43.29%) were males and 169 (56.71%) were females. The mean age of students was 21.61 ± 0.80 and 21.56 ± 0.82 respectively. It was observed that 251 (84.22 %) students had scores ranging between 70 - 79% while only 47 (15.77%) scored above 80%. Breakfast skipping was observed in 78 (60.46%) males and 114 (67.46%) of females. It was noted that 117 (90.70%) males and 157 (92.90%) females were having junk food once a week (n=117). Regarding caffeine intake, 36 (27.90%) males and 60 (35.50%) females denied caffeine intake.

Conclusion: Consumption of caffeine in moderate frequency and fruits daily seem to have a positive impact on academic grades of medical students whereas breakfast skipping has not declined the academic scores. More frequent fast food consumption significantly has led to higher proportion of lower grades. Future research in this regard is required to design policy to promote health and grades of medical students.

Key Words: Academic performance, breakfast, caffeine, dietary habits, fast food, fruits.

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Introduction:

Recently impact of eating habits on academic performance of students has gained attention particularly for medical students who face unique challenges for maintaining a healthy lifestyle with proper cognitive functioning. Healthy eating involves a balanced intake of proteins, carbohydrates, fats, vitamins, and minerals¹. Research has shown that dietary pattern rich in whole grains, fruits, and vegetables improves cognitive function, memory, test grades, and academic performance.²

Studies showed that healthy dietary habits can predict

undergraduate academic performance in medical students.³ It is perceived generally that medical students have a great knowledge about appropriate dietary habits. This relationship is important for their intellectual abilities, critical thinking, and information assimilation. Medical students serve as future healthcare providers, and their well-being influences their career and health.⁴

The aim of this study is to analyze the impact of eating habits on academic performance among medical students. We have an alternate hypothesis that caffeine consumption improves academic grades whereas skipping

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breakfast and fast-food consumption can lead to poor academic performance. There is insufficient published data from our region about the role of dietary habits on overall academic achievement. Our research can contribute to a more comprehensive understanding of the association between dietary habits and academic performance among medical students in Pakistan, potentially facilitating the development of targeted interventions⁵

Material and Method:

Study design: Cross sectional study.

Study setting and duration: This research was conducted by department of medicine in Fazaia Ruth Pfau medical college affiliated with Air University from February 2024 -May 2024.

Sample size: The sample size of 298 was determined by WHO sample size calculator 1.1 and setting the power of the study to 95% and a significance level of 0.05%.

Inclusion criteria:

- Students enrolled in 2nd, 3rd, and 4th year MBBS.
- Students Residing in hostel (to minimize bias regarding cultural food availability and social distractions)

Exclusion criteria:

- 1st Year students and 5th year students were excluded from the study as they didn't receive annual grades during study period.
- Nonresidents of hostel.
- Students taking supplements -dietary or medicine.

Data Collection:

After obtaining the Ethical approval vide letter number:Ref.No FRMPC-IRB-2023-30 from the committee of research ethics at Fazaia Ruth Pfau Medical College a total of 298 medical students were enrolled in this study. Written informed consent was obtained from each student prior to data collection. A structuredpretested, self-reported questionnaire was used to collect data from students which included demographic characteristics (age, gender, and residence in hostels).Their annual academic scores were recorded. To assess dietary habits, students were asked to recall their dietary intake during the two weeks preceding their exam. Information was noted about the number of meals consumed, frequency of consuming fast foods (more than once daily, once a week, twice a week or thrice a week), caffeine consumption, fruits as well as vegetables was determined.

Recall biased was minimised by checking their online orders and grocery list and account statements (local purchasing via easy paisa) as they used to maintain being

in a bounded locality during two weeks prior to exam papers.

Data Analysis:

- Data is coded numerically and transferred to the Statistical Package for Social Sciences (SPSS). Frequency and percentage were used to summarize categorical demographic characteristics. Descriptive statistics (means and standard deviation) were calculated for continuous variables. P value of less than 0.05 was considered significant.
- To reduce the confounders drug history was evaluated and excluded the students taking any supplements from the data analysis.

Results:

A total of 298 medical students studying at Fazia Ruth Pfau Medical college affiliated with Air University were enrolled in the study, out of which 129 (43.29%) were males and 169 (56.71%) were females. It was observed that the majority of students i.e. 90M and 110 F(69.77%and 65.09% respectively) had grades ranging between 70 - 79% while 11.63% male and 18.93% female students had grades above 80% as shown in Table 1.

characteristics	Males	Females
Mean Age	21.61 ± 0.80	21.56 ± 0.82
Year of study		
2nd year	32 (32.00%)	68 (68.00%)
3rd year	38 (38.38%)	61 (61.62%)
4th year	59 (59.60%)	40 (40.40%)
Grade Average		
Above 80%	15 (11.63%)	32 (18.93%)
Between 70 - 79%	90 (69.77%)	110 (65.09%)
Below 70%	24 (18.60%)	27 (15.97%)

Meal patterns	Males	Females
No. of Meals Skipped		
Daily	27 (20.93%)	47 (27.81%)
I don't skip any meal	24 (18.60%)	13 (7.69%)
once a week	21 (16.27%)	23 (13.60%)
thrice a week	42 (32.55%)	52 (30.77%)

twice a week	15 (11.62%)	34 (20.11%)
Type of Meal Skipped Most		
Breakfast	78 (60.46%)	114(67.45%)
Dinner	9 (6.9%)	7(4.14%)
Lunch	27 (20.93%)	35(20.71%)
None	15 (11.62%)	13 (7.69%)
Frequency of fast food intake in a week		
Once	45 (34.88%)	52 (30.72%)
Twice	39 (30.23%)	53 (31.36%)
Thrice	18 (13.95%)	38 (22.49%)
Daily	15 (11.62%)	14 (8.28%)
No intake of fast food	12 (9.30%)	12 (7.10%)
Frequency of Fruit Intake		
Daily	21 (16.27%)	21 (12.43%)
Once a week	0	0
Twice a week	42(32.55%)	55 (32.54%)
Thrice a week	39(30.23%)	36 (21.30%)
None	27(20.93%)	57 (33.73%)
Caffeine Intake		
Once	30(23.25)	49 (28.99%)
Twice a day	39(30.23)	46 (27.22%)
Thrice a day or more	24(18.60)	14 (8.43%)
None	36(27.90)	60 (35.50%)

We have noted that the majority of participants had three meals a day. Among all the meals, breakfast is the one that was skipped mostly by students (64.42%).

Table 3.Comparison of Dietary habits and Academic Grades of medical students				
Fast Food Intake Frequency	Grades > 80% N (%)	Grades > 70 - 79%	Grades < 70 %	P value
Daily	1 (0.33%)	28 (9.3%)	-	0.005
Once a week	18 (6.4%)	65 (21.8%)	14 (4.6%)	

Thrice a week	12 (4.0%)	32 (10.7%)	12 (4.02%)	0.01
Twice a week	11 (3.6%)	64 (21.4%)	17 (5.7%)	
No intake	5 (1.6%)	11 (3.69%)	8 (2.6%)	
Caffeine Intake Frequency	Above 80%	Between 70- 79%	Less than 70 %	
Once a day	10 (3.35%)	49 (16.44%)	20 (6.71%)	0.003
Twice a day	15 (5.03%)	56(18.79%)	14 (4.69%)	
Thrice a day or more	-	32(10.73%)	6 (2.01%)	
None	22 (%)	63(21.14%)	11 (3.69%)	
Meals skipped	Above 80%	Between 70 - 79%	Less than 70 %	0.102
Breakfast	28 (9.39%)	135 (45.30%)	29 (9.73%)	
Lunch	7 (2.34%)	47 (15.77%)	8 (2.6%)	
Dinner	5 (1.6%)	7 (2.34%)	3 (1.00%)	
none	7 (2.34%)	11 (3.6%)	11 (3.6%)	0.102
Fruit intake	Above 80%	Between 70 - 79%	Less than 70 %	
Daily	5 (1.65)	29(9.73%)	8(2.6%)	
Twice a week	9 (3.02)	71 (23.82%)	17 (5.70%)	
Thrice a week	9 (3.02)	53 (17.78 %)	13 (4.36%)	0.102
None	24 (8.05%)	47 (15.77%)	13 (4.36%)	

Table 3 shows a comparison of dietary habits of students and their academic grades. It was observed that the students who had junk food intake only once a week or did not consume at all had better average grades which ranged (p-value <0.05).

Regarding Caffeine intake it was perceived that the students who do not consume caffeine or had it only once a week had higher grades. The p-value of 0.01 indicates a significant relationship between caffeine intake and academic performance.

High caffeine intake might be associated with poorer academic performance, possibly due to its impact on sleep quality, concentration, or overall health.

Breakfast skipping was observed in majority of students. The p-value of 0.003 shows a significant relationship between meal skipping and academic performance. Skipping breakfast appears to be associated with better grades, which is unexplainable. There may be late eating habits or daytime sleep leading to missing breakfast. However, skipping lunch and dinner is associated with lower grades, indicating that missing these meals might negatively impact academic performance.

Discussion:

In our study we found various meal patterns including skipping meals, caffeine intake, fruits intake, junk food and observed their impact on academic grades. One of the

important finding was that breakfast was most frequently missed meal. Previous Studies have indicated that breakfast consumption has a beneficial effect on the academic achievement of college students⁶⁻⁹. However, in contrast our study did not find significant association between academic grades and eating breakfast before exams. These findings are consistent with a previous study¹⁰, which similarly found no relationship between missing breakfast and grades of medical students. Multiple factors contributing to breakfast skipping can be late night eating, lack of time, lack of appetite or hunger, delayed getting up in afternoon, desire to loose weight, or anxiety related rise in body temperature.

Fast food consumption has become increasingly prevalent among youth. A study conducted at Kurdistan University of Medical Sciences in Santander, Iran, reported that 60.54% of students regularly consume fast food, regardless of gender. Similarly, Dad poor et al.'s research also revealed that over half (50.5%) of hostel residents preferred fast food options. We observed that the students who were taking fast food less frequently performed better academically. A study conducted at the A Adichunchanagiri Institute of Medical Sciences found a significant negative correlation between increased fast food consumption and academic performance.¹¹

An additional goal of our research was to assess the impact of caffeine on annual grades of medical students. Caffeine (1,3,7-trimethylxanthine) is the most widely utilized psycho stimulant worldwide due to its easy availability in a variety of meals, beverages, and supplements.¹²In our study we noticed that the students who performed better academically and received higher grades either did not consume caffeine at all or only once a week. Although Research has shown that caffeine increases alertness and attention, even at lower dosages but increased consumption and frequent intake may not be beneficial academically¹³

Fruit intake was another variable of our research. we observed that the participants who had fruits as a part of their meals regularly achieved higher grades than those who did not consume fruits. It may be due to the positive effect of fruits on the health of the medical students and in turn having a positive effect on grades. One of the study reported that increased consumption of fruit among students resulted in better academic performances.¹⁴A similar study was conducted which explains failure to follow ADG fruit consumption recommendations has been linked to lower academic grades and reduced GPA 15. In a large cross-sectional study across 26 countries, Pelzer et al. discovered that students who followed fruit recommendations exhibited higher academic achievement.¹⁶

The Australian Dietary Guidelines (framework for healthy eating among the general population) stated in one of its guidelines that "Eat a wide range of nutrient-dense foods

from the five dietary groups: fruits, vegetables, grains and cereals, meat and/or dairy products daily. Additionally, sip lots of water."¹⁷

According to our findings, Our findings reinforce the importance of such guidelines for medical students, who require sustained physical and mental well-being to excel academically. A medical students need to maintain a good health status for good performance in exams. Good health, as defined by WHO, is a state of complete physical, mental, and social well-being, not merely the absence of disease or infirmity, can be attained by maintaining a good nutritional intake with fruits being an integral part of it.¹⁸

Limitations:

The study was limited to a particular university and might not be applicable to students of other universities. Lastly, the self-reported data used in our study could have been influenced by social desirability and recollection biases.

It is recommended that Longitudinal and multicenter studies should be carried out in the future to establish a causal association between dietary practices and academic achievement in order to improve the findings' generalizability outside of a single university.

Conclusion:

Consumption of caffeine in moderate frequency and fruits daily seem to have a positive impact on academic grades of medical students whereas breakfast skipping has not declined the academic scores. More frequent fast food consumption significantly has led to higher proportion of lower grades. Future research in this regard is required to design policy to promote health and grades of medical students.

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