

Assessment of Dietary Habits in Final Year Medical Students at a Public University Faculty of Medicine in Turkey During COVID-19

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ABSTRACT

Introduction: Optimal health depends on the intricate interplay of genetics, environment, and nutrition, encompassing aspects of physical, mental, and social well-being. This study rigorously assesses the dietary habits of final-year medical students during their internship, with a specific focus on understanding the implications of the COVID-19 pandemic. The overarching goal is to advocate for and contribute to the fostering of healthier lifestyles among medical students.

Materials/Methods: This descriptive research aimed to survey the entire cohort comprising 200 final-year medical students enrolled in the Faculty of Medicine at a public university. Among them, 125 participants actively participated in the online dietary survey conducted from September to October 2020.

Results: During their internship, most participants had two (35.2%) or three (48.8%) daily meals, often skipping breakfast (40.0%) due to lack of appetite or

opportunities. Approximately 77% maintained underweight or normal weight. The majority (95.2%) lacked a specific dietary pattern. Protein and carbohydrates were favored (75.3% for females, 96.2% for males), with more females choosing fruits and vegetables.

Conclusions: This study underscores the imperative for an all-encompassing nutrition education framework within medical student curricula. It unveils discernible variations in dietary practices, encompassing the consumption of nuts, sugary foods, energy drinks, and tea/coffee, stratified by gender and body mass index. Furthermore, the investigation establishes that exam preparation significantly influences dietary habits. Notably, independent living emerges as a pivotal factor shaping preferences for sugary foods.

Keywords: Intern, Medical School, Nutrition, Student

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Introduction

The primary goal for both society and individuals is to achieve optimal health, encompassing physical, mental, and social well-being. This is influenced by a combination of genetic and environmental factors [1]. Among these factors, nutrition (shaped by education, finances, and family traits) significantly impacts an individual's nutritional status [2]. Nutrition involves consuming vital nutrients essential for growth, development, and overall well-being. Optimal nutrition is achieved by obtaining essential energy and nutrients for bodily growth, repair, and function, along with their efficient utilization [3]. It also supports social interactions, meets psychological needs, and often serves as a source of pleasure, social approval, or societal conformity [4].

As a fundamental human need, nutrition significantly impacts overall well-being, and its attainment is crucial for a healthy life, requiring knowledge of food choices. Without a proper understanding of nutrition, establishing and maintaining healthy dietary habits becomes challenging. Global inequalities, influenced by socioeconomic conditions, affect food accessibility, creating disparities; some lacking essential nutrients, while others overindulge. For instance, a study in the United Kingdom reveals that higher-income individuals favor more fruits, while lower-income individuals often choose sugar-rich or processed foods, emphasizing the substantial impact of socioeconomic factors on dietary patterns and nutrition [5].

Establishing and maintaining recommended nutrient levels is crucial for health maintenance, as inadequate or excessive intake can lead to health issues and disrupt organ functions. Balanced nutrient intake is crucial for supporting optimal health.

In Turkey, research consistently indicates university students lacking sufficient nutrition knowledge and adopting imbalanced diets due to financial constraints [6]. This phase, transitioning to independent living, is critical for molding food preferences and habits, underscoring the significance of addressing knowledge and dietary gaps through nutrition education. Therefore, it is crucial for university students, who serve as influential role models for society, to possess adequate nutrition knowledge [7]. Addressing these gaps can enhance well-being, positively influencing future generations and promoting healthier lifestyles [6].

Medical education is a rigorous, extensive process varying in duration across countries, encompassing undergraduate and postgraduate periods. The complexities arise from intricate content, professional risks, and lengthy training.

In Turkey, the final year of the 6-year medical education program is known as the internship period. This phase marks a crucial transition for medical students, shifting from learners to active contributors in clinical decision-making under experienced faculty guidance. This year prioritizes practical application over theoretical coursework.

Upon entering the hospital setting, students confront various challenges in their early professional journey, including diverse responsibilities, unclear training protocols, heavy workloads, professional anxieties, instances of patient violence, negative interactions with healthcare peers, and financial strains. During this term, medical students may develop irregular eating habits.

Environmental factors, including the ongoing pandemic, notably affect eating habits. Research suggests that isolation and social media recommendations have caused significant shifts in eating habits, particularly among adults [8].

This study aims to analyze the eating habits of final-year medical students during their internship in Istanbul, with a specific focus on the impact of the COVID-19 pandemic. The objective is to assess these habits, examining how variables such as gender, body mass index (BMI), exam preparation, living arrangements, internship type, and monthly income may influence eating habits.

MATERIALS AND METHODS

This study employed a descriptive research design among sixth-year medical students at a public university in Istanbul from September to October 2020, coinciding with the COVID-19 pandemic. The aim was to include the entire population of 200 final-year medical students without sampling, but ultimately, 125 participants completed the online dietary habits survey. The limited participation was likely due to the challenges posed by lockdowns during the COVID-19 pandemic, which restricted our ability to reach the full student population.

Due to pandemic conditions, data collection relied on an online survey, adhering to health and safety measures. Only voluntary students participated. Ethical approval for the study (Protocol No. 09.2020.1056) was granted by the Clinical Research Ethics Committee of the respective university on October 2, 2020, adhering to the ethical standards outlined in the Helsinki Declaration, governing medical research involving human subjects.

Participants completed a 50-question online survey, divided into two sections. The first 12 questions gathered socio-demographic information, while the

subsequent section comprised 38 questions assessing eating habits. The survey aimed to acquire comprehensive data on participants' socio-demographic characteristics and dietary behaviors.

The distribution of socio-demographic data was shown using frequencies and percentages. For statistical analysis of categorical data, either the Pearson Chi-Square Test or Fisher's Exact Test was employed.

A significance level of $P < 0.05$ was accepted as the level of statistical significance.

RESULTS

A total of 125 participants were involved, with 58.4% being female. The mean age was 23.96 ± 1.21 years (min=22, max=32). The distribution of sociodemographic characteristics is summarized in Table 1.

Table 1. Distribution of Participants' Sociodemographic Characteristics

Socio-demographic Characteristics	n	%
Gender (n=125)		
• Female	73	58,4
• Male	52	41,6
The longest inhabited place (n=125)		
• Istanbul	50	40,0
• Outside of Istanbul.	75	60,0
Current place of residence (n=125)		
• Dormitory	3	2,4
• Living alone at home	46	36,8
• Living with friends at home	42	33,6
• Living with family	30	24,0
• Living with relatives	1	0,8
• Living with siblings at home	3	2,4
Monthly income (n=125)		
• 0-400 TL	0	0,0
• 401-800 TL	10	8,0
• 801-1200 TL	24	19,2
• >1201 TL	91	72,8
<i>During that period, 1 Turkish lira (TL) was approximately equal to 0.13 US dollars (USD).</i>		
<i>(Note: The intern salary was approximately as 92 dollars)</i>		
Internship (n=125)		
• Emergency Medicine	19	15,2
• Internal Medicine	28	22,4
• Pediatrics	30	24,0
• Public Health-Family Medicine	23	18,4
• Elective	25	20,0
Exam preparation (n=125)		
• Those who are not preparing for any exam	10	8,0
• Those preparing for the TUS (Turkish Medical Specialty Exam)	91	72,8
• Those preparing for exams other than TUS	20	16,0
• Those preparing for both TUS and other exams	4	3,2
Age (23,96 ± 1,21)	Mean+SD (standard deviation)	Min. and Max
• Female (n=73)	23,84 ± 1,23	22-32
• Male (n=52)	24,13 ± 1,17	23-28

Regarding eating habits, a significant portion reported having three meals a day (48.8%).

Most participants (88%) reported skipping meals, with breakfast being the most frequently

skipped (40.0%) (Table 2). Reasons for skipping included "not feeling like eating" (30.4%) and "forgetting or not finding the opportunity" (26.6%).

Table 2. Distribution of Participants by Meal Frequency, Skipped Meals, Body Mass Index, and Eating Patterns

	n	%
NUMBER OF DAILY MEALS (n=125)		
• One	2	1,6
• Two	44	35,2
• Three	61	48,8
• Four	17	13,6
• Five or more	1	0,8
SKIPPED MEALS (n=125)		
• No meal skipped	15	12,0
• Breakfast	50	40,0
• Lunch	39	31,2
• Dinner	4	3,2
• Snacks	17	13,6
BODY MASS INDEX (n=124) (Personal declarations)		
• Underweight and normal weight	96	76,8
• Overweight and obese	28	22,4
DIETARY PATTERN (n=122)		
• Vegetarian	0	0,0
• Vegan	1	0,8
• No specific dietary practice	119	95,2
• Carnivorous diet	2	1,6

During the internship period, women exhibited a higher frequency of meal consumption compared to men ($p=0.007$). The shift in eating habits among men was less pronounced than that observed in women ($p=0.022$). Notably, women demonstrated a significantly elevated intake of fruits and vegetables compared to men ($p=0.004$). Furthermore, the proportion of female participants abstaining from energy drinks (98.6%) and male participants refraining from tea/coffee consumption (21.2%) was notably higher than their counterparts of the opposite gender ($p<0.001$ and $p=0.004$, respectively). A comprehensive breakdown of the changes in participants' dietary habits between genders during this period is provided in Table 3.

No significant difference was observed between men and women concerning smoking, multivitamin use, alterations in eating habits when experiencing sadness or tiredness, and changes in eating habits during moments of happiness or excitement (Table 3).

Table 4 illustrates the distribution of changes in participants' eating habits based on their BMI. Participants categorized as underweight or having a normal BMI exhibited a higher likelihood of consuming four or more meals compared to those

in the overweight and obese categories ($p=0.042$). Individuals classified as overweight or obese (75.0%) were more inclined to abstain from consuming nuts during their breaks compared to participants in other BMI categories (37.5%) ($p=0.004$). Furthermore, a comparison of take-out food preferences revealed that 92.3% of individuals in the overweight and obese category and 72.1% of other participants opted for fast-food or home-cooked meals ($p=0.032$).

No differences were identified between individuals classified under the underweight and normal BMI categories and those in the overweight and obese categories regarding changes in eating habits throughout the internship period, consumption of sugary foods during breaks, nutrient content at lunch and dinner, smoking, energy drink consumption, tea/coffee consumption, multivitamin use, alterations in eating habits when feeling sad or tired, and changes in eating habits during moments of happiness or excitement (Table 4).

Within the duration of the internship, 21.6% of students reported smoking, and no significant differences were found in terms of BMI, consumption of sugary foods during breaks, and tea/coffee consumption between smokers and non-

smokers. However, a notable finding was that 18.5% of smokers and 6.1% of non-smokers did not consume energy drinks during this period. The difference in energy drink consumption between smokers and non-smokers was statistically significant (p=0.047).

Based on the analysis of participants' "Longest-lived place," no statistically significant

differences were found in the reported eating habits presented in Tables 3 and 4 when considering whether they resided in Istanbul or outside of Istanbul. Likewise, when examining the "eating pattern," no statistically significant differences were observed in the distribution of eating habits as outlined in Tables 3 and 4.

Table 3. Distribution of Dietary Habits During Internship Period by Gender

Dietary Habits During Internship Period	Male		Female		Total		P value
	n	%***	n	%***	n	%***	
Daily Meal Frequency (n=125)							0,007*
One and Two	25	48,1	21	28,8	46	36,8	
Three	25	48,1	36	49,3	61	48,8	
Four or more****	2	3,8	16	21,9	18	14,4	
Changes in Eating Habits (n=125)							0,022*
Significant change							
Some change	4	7,7	13	17,8	17	13,6	
No change****	21	40,4	39	53,4	60	48,0	
	27	51,9	21	28,8	48	38,4	
Nut Consumption During Breaks (n=125)							<0,001*
• Increased	2	3,8	15	20,5	17	13,6	
• Decreased	4	7,7	7	9,6	11	8,8	
• No change	9	17,3	30	41,1	39	31,2	
• Does not consume****	37	71,2	21	28,8	58	46,4	
Sugary Foods Consumption During Breaks (n=125)							0,017*
• Increased	5	9,6	17	23,2	22	17,6	
• Decreased ****	1	1,9	9	12,3	10	8,0	
• No change	19	36,5	16	21,9	35	28,0	
• Does not consume	27	51,9	31	42,5	58	46,4	
Ordering Food from Outside (n=121)							0,015**
• Fast food or home-cooked meals	44	88,0	49	69,0	93	76,9	
• Does not order	6	12,0	22	31,0	28	23,1	
Nutrient Content at Lunch and Dinner (n=125)							0,004**
• Protein	24	46,2	20	27,4	44	35,2	
• Carbohydrate	26	50,0	35	47,9	61	48,8	
•Fruits and vegetables****	2	3,8	18	24,7	20	16,0	
Cigarette Usage (n=125)							0,133*
• Increased	5	9,6	6	8,2	11	8,8	
• Decreased	3	5,8	0	0,0	3	2,4	
• No change	7	13,5	6	8,2	13	10,4	
• Does not consume	37	71,2	61	83,6	98	78,4	
Energy Drink Consumption (n=125)							<0,001**
• Increased	6	11,5	0	0,0	6	4,8	
• No change	4	7,7	1	1,4	5	4,0	
• Does not use****	42	80,8	72	98,6	114	91,2	
Tea/Coffee Consumption (n=125)							0,004**
• Increased	15	28,8	29	39,7	44	35,2	
• Decreased	2	3,8	1	1,4	3	2,4	
• No change	24	46,2	41	56,2	65	52,0	

• Does not consume****	11	21,2	2	2,7	13	10,4	
Multivitamin Usage (n=124)							
• Increased	7	13,7	11	15,1	18	14,5	0,234**
• No change	1	2,0	7	9,6	8	6,5	
• Does not use	43	84,3	55	75,3	98	79,0	
Eating Habits When Feeling Sad/Tired (n=123)							
• Increased	15	28,8	23	32,4	38	30,9	0,078*
• Decreased	23	44,2	40	56,3	63	51,2	
• No change	14	26,9	8	11,3	22	17,9	
Eating Habits When Feeling Happy/Excited (n=125)							
• Increased	8	15,4	20	27,4	28	22,4	0,204*
• Decreased	18	34,6	26	35,6	44	35,2	
• No change	26	50,0	27	37,0	53	42,4	

*Pearson's Chi-Square Test **Fisher's Exact Test ***Percentages are column percentages. ****The row that creates significance

Table 4. Distribution of Dietary Habits During the Internship Period According to Participants' Body Mass Indexes

Dietary Habits during Internship Period	Body Mass Index						P value
	Normal weight or underweight		Overweight or Obese		Total		
	n	%***	n	%***	n	%***	
Daily Meal Frequency (n=116)							0,042*
• One or Two	31	35,2	12	42,9	43	37,1	
• Three	40	45,5	16	57,1	56	48,3	
• Four or more****	17	19,3	0	0,0	17	14,7	
Changes in Eating Habits (n=116)							0,360*
• Significant change	40	45,5	16	57,1	56	48,3	
• Some change	15	17,0	2	7,1	17	14,7	
• No change	33	37,5	10	35,7	43	37,1	
Nut Consumption During Breaks (n=116)							0,004**
• Increased	15	17,0	2	7,1	17	14,7	
• Decreased	7	8,0	2	7,1	9	7,8	
• No change	33	37,5	3	10,7	36	31,0	
• Does not consume****	33	37,5	21	75,0	54	46,6	
Sugary Foods Consumption During Breaks (n=116)							0,103**
• Increased	17	19,3	3	10,7	20	17,2	
• Decreased	9	10,2	0	0,0	9	7,8	
• No change	26	29,5	7	25,0	33	28,4	
• Does not consume	36	40,9	18	64,3	54	46,6	
Nutrient Content at Lunch and Dinner (n=116)							0,222*
• Protein	26	29,5	13	46,4	39	33,6	
• Carbohydrate	45	51,1	12	42,9	57	49,1	
• Fruits and vegetables	17	19,3	3	10,7	20	17,2	
Cigarette Usage(n=116)							0,191**
• Increased	7	8,0	4	14,3	11	9,5	
• Decreased	1	1,1	2	7,1	3	2,6	
• No change	8	9,1	3	10,7	11	9,5	

• Does not consume	72	81,8	19	67,9	91	78,4	
Energy Drink Consumption (n=116)							
• Increased	3	3,4	2	7,1	5	4,3	0,537**
• No change	2	2,3	1	3,6	3	2,6	
• Does not consume	83	94,3	25	89,3	108	93,1	
Tea/Coffee Consumption (n=116)							
• Increased	34	38,6	8	28,6	42	36,2	0,373**
• Decreased	2	2,3	0	0,0	2	1,7	
• No change	45	51,1	15	53,6	60	51,7	
• Does not consume	7	8,0	5	17,9	12	10,3	
Multivitamin Usage (n=116)							
• Increased	13	14,8	4	14,3	17	14,7	0,358**
• No change	7	8,0	0	0,0	7	6,0	
• Does not use	68	77,3	24	85,7	92	79,3	
Eating Habits When Feeling Sad/Tired (n=114)							
• Increased	26	29,9	10	37,0	36	31,6	0,067*
• Decreased	49	56,3	9	33,3	58	50,9	
• No change	12	13,8	8	29,6	20	17,5	
Eating Habits When Feeling Happy/Excited							
• Increased	21	23,9	5	17,9	26	22,4	0,802*
• Decreased	32	36,4	11	39,3	43	37,1	
• No change	35	39,8	12	42,9	47	40,5	

*Pearson's Chi-Square Test **Fisher's Exact Test ***Percentages are column percentages. ****The row that creates significance

Examining changes in eating habits during the internship period with respect to participants' exam preparation status, it was noted that 93.0% of those preparing for exams refrained from consuming energy drinks, whereas 70.0% of those not preparing for exams also abstained from energy drink consumption. The proportion of participants who increased their energy drink consumption was significantly lower in the group preparing for exams compared to the group not preparing for exams ($p=0.04$).

Throughout the internship, a significant decline in eating habits was observed among students preparing for exams when experiencing feelings of sadness/tiredness or happiness/excitement, compared to those who were not preparing for exams ($p=0.001$ and $p=0.007$, respectively). Among participants preparing for exams, 54.9% reported eating less when feeling sad/tired, whereas among those not preparing for exams, only 10.0% reported the same. Similarly, 24.3% of participants preparing for exams reported decreased food intake when feeling happy/excited, while none of the participants not preparing for exams reported a similar pattern.

Upon examining variables such as "Number of daily meals," "Changes in eating

habits," "Nut consumption during breaks," "Consumption of sugary foods during breaks," "Ordering food from outside," "Nutrient content at lunch and dinner," "Smoking habits," "Tea/coffee consumption," and "Multivitamin usage" in relation to exam preparation status, no statistically significant differences were found.

According to the data, among participants who live alone, a significant majority have a monthly income of 1200 TL and above (87.0%, $n=40$). Additionally, within this group, 21.7% have reported an increase in their consumption of sugary foods during breaks. The observed difference in the consumption of sugary foods during breaks between participants who live alone and those in other living arrangements is statistically significant ($p<0.01$).

Amongst participants ($n=77$) undergoing intense internships such as Internal Medicine, Pediatrics, and Emergency Medicine, 18.2% reported a significant change in their eating habits during the internship period. Similarly, among participants ($n=23$) in moderately intense internships such as Public Health and Family Medicine, 4.3% reported a significant change in their eating habits. Additionally, among participants ($n=25$) in less intense internships such as elective courses, 8.0% reported a significant change in their eating habits.

The observed differences in eating habits among these groups are statistically significant ($p=0.003$), indicating notable variations based on the intensity of the internship program.

In a similar vein, the study revealed that 10.4% ($n=8$) of students in intense internships, 17.4% ($n=4$) in moderately intense internships, and 20.0% ($n=5$) in less intense internships reported an increase in their consumption of nuts during their internship period.

The difference in nut consumption among the internship groups was statistically significant ($p=0.048$), indicating notable variations based on the intensity of the internship program.

DISCUSSION

In this study involving 125 participants, we investigated alterations in individuals' dietary habits during their internship and the pandemic. The findings revealed significant changes in dietary habits among women during the internship, while most men reported no substantial changes. This aligns with a prior study at Istanbul University Faculty of Medicine, indicating a decline in regular dietary habits as medical school years progress [9].

The demanding working conditions during internships may contribute to difficulties in maintaining adequate attention to nutrition.

Final-year medical students exhibited heightened rates of meal avoidance, likely attributed to increased work demands and challenges related to the pandemic. Breakfast emerged as the most frequently skipped meal, often due to appetite concerns or time constraints. This pattern aligns with research from Barcelona University, indicating a 7.2% prevalence of breakfast skipping and increased afternoon and late-night snacking among students [10]. Additionally, women reported a notable rise in nut and sugary food consumption during work breaks, consistent with findings from a Jordanian study indicating increased sugar consumption post-pandemic [11].

While body image pressures and the prevailing on-the-go eating culture contribute to eating disorders and obesity in some young individuals in developed countries [12], our study observed a predominant occurrence of participants within the underweight or normal weight range.

Regarding nutrient content at lunch and dinner, our study found a predominance of protein and carbohydrates. In contrast, a Spanish study during the pandemic reported a 25.0% increase in the consumption of healthy foods, such as fruits and vegetables, among the general population [10].

Similarly, a Jordanian study supported these findings, showing a notable rise in fruit and vegetable consumption [11].

In the context of multivitamin usage, interns did not show a significant increase during the internship period, contrary to the prevailing literature emphasizing increased interest in alternative medicine during the Covid-19 pandemic, particularly for fortifying the immune system [13]. Another study reported a lower prevalence of multivitamin usage at 15.4% during the pandemic [14]. It is imperative to acknowledge these variations in multivitamin utilization across diverse studies and populations, recognizing potential influences from cultural beliefs, health consciousness, and access to information and supplements.

Additionally, the prevalence of smoking among final-year students was determined to be 21.6%, with males showing a higher rate. Notably, 19.2% of participants increased their smoking during this period. This aligns with a study in Riyadh, indicating a smoking prevalence of 19.0% among medical school students, escalating to 24.0% among males [15]. Furthermore, in an annual evaluation of smoking in the medical school, it was noted that final-year students smoked more compared to their first-year counterparts. In a comprehensive review of 65 articles from China, the prevalence of smoking among medical students was found to be 10.93%. Among these studies, 55 reported a significant gender-based difference in tobacco use, with prevalence increasing from 8.94% in the first year to 22.05% in the final year [16]. Moreover, our study revealed that participants who smoked consumed significantly more energy drinks than non-smokers. However, no noteworthy differences were observed concerning BMI, tea/coffee consumption, and the intake of sugary foods.

For energy drink consumption, the prevalence among interns was 8.8%, with 4.8% noting an increase during their internship. Males, notably, exhibited a higher inclination toward increased consumption. In the realm of tea/coffee intake, 35.2% of all participants heightened their consumption, with females demonstrating a statistically significant increase. A study at Marmara University Faculty of Medicine reported a prevalence of energy drink usage at 32.6% [17]. Furthermore, a comprehensive literature review comprising 13 articles reported a prevalence of stimulant use, including energy drinks and coffee, at 13.24% among medical students, highlighting a higher prevalence among males [18]. The observed upswing in consumption during the final year of medical school could be attributed to the heightened workload and inadequate sleep time during this period.

While assessing the relationship between mood changes (feeling happy/sad) and eating habits, we did not identify a significant association. However, given the pandemic-imposed restrictions

and quarantines, it is plausible that students' eating habits may have been impacted. A parallel study exploring changes in eating habits among healthcare workers during the pandemic reported a detrimental effect, particularly affecting women. Additionally, the study suggested a potential link between these dietary changes and increased stress and mood fluctuations amid pandemic conditions [13]. The disruptions caused by the pandemic, coupled with elevated stress levels, might have contributed to alterations in eating habits among university students, emphasizing the need to address and support their nutritional well-being during such challenging times.

We observed that overweight and obese participants had notably lower daily meal frequencies compared to others, as indicated by their BMI. However, no significant difference was identified in the changes in eating habits between these groups. It's worth noting that a study in Istanbul yielded similar results, reporting that 57.8% of university students consumed three meals a day, with underweight and normal-weight individuals having higher daily meal frequencies [19]. The disparity between our study's findings on changes in eating patterns and the existing literature may be attributed to an insufficient sample size in the overweight and obese group. These findings underscore the importance of conducting further research with larger sample sizes to better understand the impact of BMI on eating habits, especially during challenging times like the pandemic. Understanding the relationships between body weight and dietary behaviors can inform targeted interventions to promote healthier eating habits and overall well-being among university students and the general population.

Regarding the impact of exam preparation on dietary behaviors, no significant relationship was found between daily meal frequency and changes in eating patterns among the exam preparation and non-exam preparation groups. However, it was noted that students preparing for exams had significantly more influenced eating habits by their feelings of sadness or happiness compared to those not preparing for exams. While over half of the participants in the non-exam preparation group reported no change in their eating habits when feeling sad, nearly all reported no change when feeling happy.

Fluctuating emotional states have been shown to contribute to disruptions in eating habits [20]. Stress, a common factor in the literature, can lead to changes in eating habits, resulting in either increased or decreased food intake. Considering that exams contribute to heightened stress levels among students, similar changes in eating habits are likely to occur [21]. A parallel study at a medical faculty in Izmir also reported changes in eating habits during exam periods [22]. The lack of a relationship found

in our study may be attributed to the very low number of participants not preparing for exams. Notably, our findings differ from a meta-analysis that concluded negative mood did not significantly affect eating habits, whereas positive mood had a slight increasing effect on eating habits [23]. The contrast in results between our study and the meta-analysis may be attributed to variations in participant characteristics, cultural factors, and differences in study designs.

Energy drinks are commonly favored by university students, particularly during exam preparation. We found that almost all students preparing for exams did not consume energy drinks during this period. In contrast, non-exam preparation students exhibited a statistically significant increase in energy drink consumption. This contrasts with a similar study in the United States, supporting the literature by demonstrating that as perceived stress increased, energy drink consumption also increased [24]. The disparity in results between our study and the literature may be attributed to the limited number of non-exam preparation students in our sample.

Furthermore, our study revealed that most students living alone with an income level of 1200 TL and above significantly increased their consumption of sugary snacks during break times. In contrast, a study conducted in the United States between 2005 and 2008 reported different findings, indicating that participants with low income had a higher consumption of sugary beverages [25]. Additionally, another study in the United States suggested that individuals with low income prefer sugary foods to fulfill their energy needs [26].

Throughout our research project, we acknowledge several limitations that may have influenced the validity and generalizability of our findings. Firstly, changes in dietary habits relied on participants' self-reports, making them susceptible to recall bias and subjectivity. Additionally, we did not use a standardized scale to evaluate dietary habits, which may have affected the consistency and comparability of the data. Accurate recall of eating behaviors may pose challenges, introducing potential measurement errors in the data.

Moreover, dietary habits naturally fluctuate over time, and our study's relatively brief data collection duration may not fully capture long-term dietary patterns. Additionally, the reliance on voluntary participation in data collection may introduce selection bias, as participants' dietary habits might differ from non-participants.

The small sample size could limit statistical power and may not fully represent the larger population of medical students or other demographics, potentially impacting generalizability.

Furthermore, our research period coincided with the Covid-19 pandemic and associated lockdowns, likely influencing individuals' dietary

habits due to changes in routines, food availability, and psychological stress. These unique circumstances may hinder comparing our results with studies conducted under different conditions.

Despite these limitations, our study offers valuable insights into the eating habits of medical students during their internship period and the potential impact of exam preparation on dietary behaviors. Future studies, with larger and more diverse samples and extended data collection periods, could explore these relationships more comprehensively and address some of the limitations encountered in our research.

CONCLUSIONS

During their medical school internships amid the COVID-19 pandemic, students experienced notable shifts in dietary patterns, often skipping breakfast and indulging in sugary snacks during breaks. Our study found that many participants preferred fast food or takeout, with nearly half following high-protein and high-carbohydrate diets, while vegetable and fruit intake was deficient. Addressing these imbalances through educational interventions that emphasize the importance of a healthy diet could be valuable additions to the curriculum. Encouraging students to opt for nutritious options like nuts or fruits instead of sugary snacks can promote overall well-being. Additionally, during intense exam preparation, students' dietary choices are significantly influenced by emotional factors. Raising awareness of the food-mood connection through seminars and providing psychological support to manage stress can promote healthier eating habits and enhance overall well-being.

To overcome memory-related limitations in assessing dietary habits, prospective observational studies can utilize daily self-reporting, supplemented by objective measurements or dietary records for accuracy. Implementing regulations in educational institutions, such as modifying cafeteria menus to include nutritious choices and offering free healthy options at campus entrances, especially to address skipped breakfast meals, can create a supportive environment. These measures can motivate students to adopt healthier dietary habits and improve their overall well-being. Furthermore, medical schools should provide comprehensive nutrition education to equip future healthcare professionals with essential knowledge for promoting healthy lifestyles. Expanding educational opportunities and seminar sessions with interactive teaching strategies can help integrate this knowledge into students' daily lives, enabling them to advocate for healthy living.

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Availability of data and material

Available upon request.

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