Razi Med J. 2025;1(4):288-298
https://doi.org/10.69667/rmj.25402
Razi Medical Journal
https://razi.edu.ly/rmj/index.php/hm

Original paper

Determinants of Food Choices in University Cafeterias: A Cross-Sectional Study Among Public Health Students in Libya

Faiza Nouh*, Salima Elfagi, Mohamed Buzgeia, Ahlam Adel, Mawadda Salah, Enas Hassan, Safa Edress

Department of Nutrition, Faculty of Public Health, University of Benghazi, Benghazi, Libya
Corresponding Author: *Faiza.nouh@uob.edu.ly*

Abstract
Factors that influence subjects' food choices have been widely searched. However, factors that shape the food selections of university students have not been as widely assessed. It is a cross-sectional study on basic medical sciences students in the Faculty of Public Health of both sexes, carried out at the Medical Campus, University of Benghazi, in the Libyan city of Benghazi from January to June 2025. The sample size is 300 students. 6.3 % of the sample are males, and females represent 93.7 % of the total sample. (32%) of the students live in families with 4 to 6 members. (62.69%) of the participants have family income between 1000 - 3000 Libyan Dinar (LD). Cafeteria visits and food selections were found to be significantly affected by food cleaning, food odor, price, menu, and cafeteria cleaning. Significant associations are noticed between independent variables and dependent variables at the 0.01 level. Further research should be conducted in order to determine more specific factors that affect the food choices of college commuter students in more and different departments and faculties.
Keywords: *Food, Choices, University, Students, Cafeterias*

Received: *24/07/25*
Accepted: *26/09/25*
Published: *06/10/25*

Introduction

Factors that shape subjects' food selections have been widely searched. However, the factors that affect university students' food selections have not been as widely studied [1,2]. Cafeterias are the main source for students' food needs from breakfast to dinner. Most students spend more time at university and rely mostly on the food provided by the university cafeterias. Accordingly, it is difficult for operators to keep the quality of foodservice at the university cafeterias [3-4]. A cafeteria is a place where food and beverages are sold in schools, factories, and universities. The type of cafeteria includes institutional cafeterias such as hospital cafeterias, school cafeterias, and university cafeterias. Commercial cafeterias include restaurant-style cafeterias, food court cafeterias, fine dining cafeterias, casual dining cafeterias, and school cafeterias. Mobile cafeterias include cafeteria cars, food trucks, and home-delivered meals. Specialty cafeterias include health-focused cafeterias, cafeteria-buffet hybrids, ethnic cafeterias, and office cafeterias. Non-commercial cafeterias include community cafeterias, charity cafeterias, and military cafeterias [6-11]. University cafeterias are common meeting places for staff and students, providing a place for relaxation, leisure, and a space to have a quick lunch or snack [12].

There are several variables that influence customers' decisions to select a cafeteria. The importance of these factors differs according to cafeteria type, food type, popularity, family, and atmosphere. As a core product of a food service, beverage and food quality have been given a huge importance and have been checked for many aspects such as texture, flavour, aroma, and temperature. Beverage and food quality play a significant role in forming and determining students' satisfaction [13,14]. Price perception is shaped by factors such as previous experiences, advertising, branding, and comparisons with other products. Students are more likely to make a purchase when they believe the product offers good value for the price [15]. A menu is another significant marketing tool. The cafeteria menu is the first gate a cafeteria can communicate with students. Students can access a menu displayed on a board, a digital menu, or a printed menu. The design, colour, material, appearance, paper quality, weight, cover, and the condition (as in dirty or clean) affect the students' first impression of the cafeteria [16]. Convenience is another critical factor in students' decision-making, mainly in fast food. Convenience is the ease with which services and goods can be obtained, minimizing the risk or effort to the consumer. In the context of foodservice, convenience is usually linked to time savings [17].

The surroundings atmosphere of the cafeteria such as decoration, lighting, and cleanliness have vital role to students [18-20]. Furthermore, some students tend to select healthy and nutritious food, while others prefer high-fat and

Razi Med J. 2025;1(4):288-298
https://doi.org/10.69667/rmj.25402
Razi Medical Journal
https://razi.edu.ly/rmj/index.php/hm

energy-dense, meals due to their taste [21]. Food freshness is another factor that associated with students' satisfaction. Students believe that fresh food is less likely to be contaminated.

Also, food appearance and presentation play a significant role in influencing students' choices [22-25]. Racine et al (2022) examine the association between student behavioral, demographic, and economic factors and student fast-food purchases. They found that being low income was associated with lower Student Average Fast-Food Health Scores [26]. A systematic review by Fogolari et al (2023) reveal that qualitative information has a positive influence on students' food selection [27]. Lorenzoni, et al. (2021) conclude that healthy eating students represented a minor percentage (11.2 %) of the study population while a large section of students composed their meals combining grains with processed food or proteins (32.7 %) and only 42.9 %) of students eat fruit.

Younger age and male gender were associated with eating of none- healthy diet [28]. EL-Mani et al (2020) found that (64%) of university students change their eating behavior after entering university and (59%) of students eat unhealthy diet [29]. Mensah et al (2022) state that food prices, accessibility, and food quantity are the main factors that influencing food selection. They identify further factors such as food hygiene, foods variety, taste and societal factors such as ambience and peer influence [30].

Zhong et al (2020) conclude that food service and quality have a significant positive eefect on studnets satisfaction. Gender plays a moderating role, with the effects being stronger among females compared to males [31]. Kabir et al (2018) find that eating behaviors and food consumption among residential students are influenced by multiple factors, including cooking skills, taste preferences, dietary beliefs, personal knowledge, and perceptions; university-related factors such as exam frequency and campus culture; and environmental factors such as food availability, food cost, and time availability for meals [32]. Bidin et al (2024) reveal that the main factors influencing food choices among university students include availability and convenience, economic factors, and social influences (friends and family). [33] The current study also aims to assessing the influencing factors on food choices from university cafeterias among basic medical sciences students in Faculty of Public Health.

Methodology

It is a cross-sectional study on Libyan basic medical sciences students in Faculty of Public Health of both sexes, carried out at Medical Campus, University of Benghazi in the Libyan city of Benghazi from January to June 2025. Exclusion criteria for the study were an acute or chronic illness; pregnant and lactating were also excluded. According to the data available with the office of the registrar for the academic session 2024- 2025, there were a total of 1197 enrolled students in the mentioned department; 907 students in the first year and 290 students in the second year consisting of 76 males and 1121 females.

Based on statistical sampling techniques a sample size of at least 290 students was considered to be enough for the current study. Informed consent was obtained from the subjects who were also assured of the confidentiality of the information collected. The research was approved by the administration of Faculty of Public Health.

A detailed structured self-administered questionnaire was used including information about select socio-economic characteristics, factors affecting food choices from university cafeterias, and consumption patterns. To ensure the reliability and validity of the questionnaire, a pilot study was conducted with 30 subjects who were not included in the final sample. These participants provided feedback on the questionnaire's relevance, clarity, and feasibility, allowing for necessary refinements and revisions before the main study. This pilot testing helped identify potential issues, ensuring the questionnaire was effective in collecting relevant and accurate data from the target population. All data was coded prior to being entered into a computer. Description and analysis of data were done by SPSS version 22. Level of significance was set at $p < 0.05$.

Results

The sample size is 300 students. 6.3 % of the sample are males and females represent 93.7 % of the total sample. The age distribution shows that the subjects are predominantly between 19-20 years old (56.7 %) with only (2.3 %) between 16-18 years old. The mean age ($\pm$ SD) for both the genders is 19.4 $\pm$ 2.2. (95.33%) of participating students are single and only (4.67%) of students are married. (62.67%) of the students live in families with members seven and more. (62.69%) of the participants have family income between 1000 - 3000 Libyan Diner (LD).

Razi Med J. 2025;1(4):288-298
https://doi.org/10.69667/rmj.25402
Razi Medical Journal
https://razi.edu.ly/rmj/index.php/hm

Table 1: Subject characteristics

Age (Years)	Sex		Total
No.(%)	Male	Female	
16-18	7(2.3)	0	7(2.3)
19-20	8(2.7)	162(54)	170(56.7)
≥20	4(1.3)	119(39.7)	123(41)
Total	19(6.3)	281 (93.7)	300(100)
Age (Years) Mean ± SD	19.2± 2.2	19.5± 2.2	19.4± 2.2

Table 2: Socio-economic characteristics

Characteristics	Total	
	Number	%
Marital status		
Single	286	95.33
Married	14	4.67
Study year		
First	217	72.33
Second	83	27.67
Family members		
1-3	16	5.33
4-6	96	32
≥ 7	188	62.67
Income ((LD))		
<1000	27	9
1000-3000	188	62.69
>3000	85	28.33

LD = Libyan Diner

(43.67%) of participants agreed that food size is an important factor, while only (16.67%) of participants strongly agreed. Similarly, (46.33%) of students agree that food shape is a significant factor and (39%) of participants strongly agree. Regarding food color, (46%), (25.67%) and (24%) of the students agree, strongly agree, and neutral, respectively. Regarding food flavor, (52%) of the subjects strongly agree and (37%) of participants agree. In terms of food texture, (39%) of students agree on its importance, while (31%) of participants are neutral, and (23.33%) of participants strongly agree. Regarding food odor, (51%) of participants strongly agree and (37.33%) of participants agree. Regarding food freshness, (48.33%) of participants strongly agree and (39.33%) of subjects agree. Regarding food price, (36.33%) of participants agreed, while (26.33%) of participants strongly agreed. The presence of a menu is agreed by (46.67%) of students and (35%) of participants strongly agreed. Availability of food items is agreed by (32.67%), strongly agree by (19.67%), and (31.67%) are neutral. Availability of drink items is agreed by (37%) of students, (33.33%) are neutral, and (19%) agree. Food packaging strongly agrees by (38.33%), another (38.33%) agree, and (15%) are neutral. Lastly, food cleanliness is strongly agreed upon by (66.33%) and (27.33%) of participants are agreeing. Regarding temperature, (34.33%) of respondents strongly agree, while (40.67%) of students agree. Regarding air quality, (40.33%) strongly agreed, and (36%) of participants agreed. For noise levels, (29.33%) strongly agree, while (22%) for agree. Concerning odor, (50%) of participants strongly agree. Regarding planning and decoration, (24.67%) and (33.67%) of participants strongly agree and agree respectively. The highest percentage is (35.67%) for neutral. For equipment and furniture, (25.33%) of participants strongly agreed, and the highest percentage for those who agree (38%). Regarding customer interactions, (35.67%) of participants agree. The highest percentage is (39.67%) for neutral. Regarding cafeteria cleanliness, (63.33%) of participants strongly agree. As for the worker clothing, (38.67%) strongly agreed, and the highest percentage (39%) was for agreed. Regarding staff courtesy, (51%) strongly agree, while (38.67%) agree. Regarding toilets, the highest percentage comes from strongly agree with (60.67%). For work hours,

Razi Med J. 2025;1(4):288-298
https://doi.org/10.69667/rmj.25402
Razi Medical Journal
https://razi.edu.ly/rmj/index.php/hm

(41.67%) of participants agree. Concerning how to take an order, (38.33%) for agreed. Finally, regarding order submission, (36%), and (39.67%) of participants strongly agree and agree respectively.

Table 3: Food-related factors

Characteristics	Distribution (%)				
	Strongly agree	Agree	Neutral	Strongly disagree	Disagree
Food size	(16.67)	)43.67)	(31.67)	(7)	(1)
Food shape	(39)	(46.33)	(11.33)	(3)	(0.33)
Food color	(25.67)	(46)	(24)	(4)	(0.33)
Food flavor	(52)	(37)	(7)	(3.33)	(0.67)
Food texture	(23.33)	(39)	(31)	(5)	(1.67)
Food odor	(51)	(37.33)	(5.33)	(5.33)	(1)
Food freshness	(48.33)	(39.33)	(6.33)	(4.67)	(1.33)
Food price	(26.33)	(36.33)	(17)	(13)	(7.33)
Presence of a menu	(35)	(46.67)	(13)	(4)	(1.33)
Availability of all food	(19.67)	(32.67)	(31.67)	(12.67)	(3.33)
Availability of all drinks	(19)	(37)	(33.33)	(8)	(2.67)
Food package	(38.33)	(38.33)	(15)	(7)	(1.33)
Food cleaning	(66.33)	(27.33)	(1)	(3.67)	(1.67)

Table 4: Factors related to the cafeteria environment

Characteristics	Distribution (%)				
	Strongly agree	Agree	Neutral	Strongly disagree	Disagree
Temperature	(34.33)	(40.67)	(13.67)	(10)	(1.33)
Air quality	(40.33)	(36)	(12)	(9.33)	(2.33)
Noise	(29.33)	(22)	(21)	(19.67)	(8)
Odor	(50)	(23.33)	(11)	(11)	(4.67)
Planning and decoration	(24.67)	(33.67)	(35.67)	(4.33)	(1.67)
Equipment and furniture	(25.33)	(38)	(31.67)	(3.33)	(1.67)
Costumers	(18)	(35.67)	(39.67)	(4.67)	(1)
Restaurant cleaning	(63.33)	(29.67)	(5)	(1.67)	(0.33)
Worker cloths	(38.67)	(39)	(17.67)	(3)	(1.67)
Staff courtesy	(51)	(38.67)	(6)	(3)	(1.33)
Toilets	(60.67)	(20.33)	(3.67)	(6.67)	(8.67)
Work hours	(25.33)	(41.67)	(26.33)	(5)	(1.67)
Crowding	(32.33)	(23)	(15)	(19.33)	(10.33)
How to take an order	(35.67)	(38.33)	(15)	(7.33)	(3.67)
How to submit an order	(36)	(39.67)	(6.67)	(6.67)	(3.67)

Table 5 show that the highest percentage of students (40.67%) visit restaurants 1-2 times a week, while the lowest percentage is (6%) is for those who never visit restaurants at all and those who visit 5-6 times a week. Additionally, (30.33%) of students visit restaurants daily. Regarding the time of visit, the highest percentage of students (57.33%) do

Razi Med J. 2025;1(4):288-298
https://doi.org/10.69667/rmj.25402
Razi Medical Journal
https://razi.edu.ly/rmj/index.php/hm

not have a specific time for visiting restaurants. As for the motivation for visiting restaurants, the highest percentage of students (78.67%) are motivated by friends. Some beverages have a low daily consumption rate such as mekiata (4%), espresso (2.67%) and cortado (3.33%). In contrast, some beverages are among the most frequently daily consumption such as Arabic coffee (22.33%), French coffee (17.33%) and tea (12%). Regarding natural juices: only (12%) consumed them daily. Some beverages were rarely consumed such as Cortado, Orchid (Sahlab), Hibiscus, and Mojito. Overall, the results showed that caffeine-containing beverages are more popular among participants, than juices and energy drinks. Om Ali, rice with milk, and qashtota are not consumed by (96%), (94.67%) and (88.33%) respectively. Regarding daily consumption, waffle, cake, and pancake have the highest consumption, at 7%, (6%) and (3.67%) respectively. For 1-2 times per week consumption, waffle, creep, and cake has the highest percentage at (18.67%), (15%) and (16.33%) respectively. As shown in (Table 8); the highest percentage of individuals who do not consume a Clopp, is (82%), followed by manaqeesh at (76.67%), and meat sandwich at (74%). Regarding daily consumption, the highest percentage is observed for fried potatoes with (18.33%), followed by chicken sandwich at (11.67%), and toast at (11.33%). For those consuming food 1-2 times per week, the highest percentage is seen for fried potatoes with (28.33%), followed by chicken sandwich at (26.33%), and pizza at (22.33%). In the 3-4 weekly consumption category, chicken sandwich has the highest percentage at (15.33%).

Table 5: Factors related to the students

Characteristics	Distribution N (%)
Frequency of restaurant visits	
No visit	18 (6)
Daily	91 (30.33)
1-2 weekly	122 (40.67)
3-4 weekly	51 (17)
5-6weekly	18 (6)
Time of visit	
No specific time	172 (57.33)
7-10 am	23 (7.67)
10 am -1 pm	80 (26.67)
1-4 pm	19(6.33)
4- 8pm	6 (2)
Motivation for restaurant visits	
Friends	236 (78.67)
Prefer eating outside home	31 (10.33)
Difficulty of preparing food	33 (11)

Table 6: Food consumption pattern (Drinks)

Food	Consumption pattern (%)				
	No	Daily	1-2 weekly	3-4 weekly	5-6weekly
Mekiata	90.67	4.00	2.67	1.00	1.67
Espresso	92.67	2.67	2.67	0.67	1.33
Nesscaffee	29.00	30.33	23.67	10.67	6.33
Cupchino	69.00	9.67	14.67	4.33	2.33
Cortado	96.33	0.33	2.67	0.33	0.33
Caffee late	91.00	2.33	3.00	2.00	1.33
Ovalteen	85.00	3.33	7.00	3.00	1.67
Spesial	93.00	0.67	3.33	2.00	1.00
Cupchino	73.67	6.67	12.67	4.00	3.00
Amricano	92.33	1.00	3.67	1.67	1.33

Razi Med J. 2025;1(4):288-298
https://doi.org/10.69667/rmj.25402
Razi Medical Journal
https://razi.edu.ly/rmj/index.php/hm

Hot chocolate	65.33	6.00	18.33	5.67	4.67
Tea	72.00	12.00	8.33	4.67	3.00
Anise ((yanson))	87.00	4.00	5.67	1.67	1.67
Orchid ((sahleb))	86.67	3.00	6.00	1.33	3.00
Mint	87.67	2.33	4.67	4.00	1.33
Ginger	93.67	2.33	0.67	1.33	2.00
Hibiscus	89.33	2.33	4.67	1.00	2.67
Hot cider	93.33	1.67	1.33	1.67	2.00
Arabic coffee	61.67	22.33	11.33	2.33	2.33
Turkish coffee	89.33	4.00	2.67	2.00	2.00
Franch coffee	94.66	1.00	1.67	0.67	2.00
Hazelnut coffee	93.33	1.33	2.33	1.67	1.33
Ice coffee	80.33	3.67	9.33	4.00	2.67
Milk shake	80.00	4.67	8.67	3.67	3.00
Natural juices	46.00	12.00	28.33	8.67	5.00
Smoothie	85.00	2.33	9.00	2.00	1.67
Mojito	87.33	1.33	4.67	3.33	3.33
Energy drinks	82.33	3.33	9.00	3.67	1.67

Table 7: Food consumption pattern (Sweets)

Food	Consumption pattern (%)				
	No	Daily	1-2 weekly	3-4 weekly	5-6weekly
Ice cream	82.33	3.33	6.67	3.67	4.00
Om Ali	96.00	0.00	0.00	1.67	2.33
Rice with milk	94.67	0.33	2.67	1.00	1.33
Qashtota	88.33	1.33	3.33	5.00	2.00
Cake	71.00	6.00	16.33	4.33	2.33
Creep	67.00	3.00	15.00	9.33	5.67
Corosan	87.33	1.00	7.00	2.00	2.67
Waffle	64.00	7.00	18.67	5.00	5.33
Pancake	80.67	3.67	8.67	3.33	3.67

Table 8: Food consumption pattern (pastries and sandwiches)

Food	Consumption pattern (%)				
	No	Daily	1-2 weekly	3-4 weekly	5-6weekly
Toast	60.33	11.33	18.67	5.67	4.00
Clopp	82.00	3.33	8.33	4.00	2.33
Chicken sandwich	42.33	11.67	26.33	15.33	4.33
Meat sandwich	74.00	3.33	11.67	7.33	3.67
Fried potatoes	36.00	18.33	28.33	12.33	5.00
Pizza	56.33	6.33	22.33	9.33	5.67
Manaqeesh	76.67	3.67	10.33	6.33	3.00

Razi Med J. 2025;1(4):288-298
https://doi.org/10.69667/rmj.25402
Razi Medical Journal
https://razi.edu.ly/rmj/index.php/hm

Significant association occurs between independent variables and dependent variables at 0.01 levels, two- tailed toward cafeteria visits. Food odor is a strongest relationship at (r= 0.672). Cafeteria cleaning is second (0.668); while menu is (0.656). Surrounding cleanliness was at 0.640.

Table 9: Pearson Correlation Analysis

Items		Food Cleaning	Food odor	Price	Menu	Restaurant cleaning	Surrounding Cleaning	Restaurant visits
Food Cleaning	Pearson Correlation	1	.713**	.629**	.635**	.586**	.533**	.554**
	Sig. (2-tailed)		.000	.000	.000	.000	.000	.000
	N	300	300	300	300	300	300	300
Food odor	Pearson Correlation	.713**	1	.601	.726**	.670**	.690**	.672**
	Sig. (2-tailed)	.000		.000	.000	.000	.000	.000
	N	300	300	300	300	300	300	300
Price	Pearson Correlation	.629**	.601**	1	.639**	.534**	.488**	.561**
	Sig. (2-tailed)	.000	.000		.000	.000	.000	.000
	N	300	300	300	300	300	300	300
Menu	Pearson Correlation	.635	.726**	.639**	1	.669**	.616**	.656**
	Sig. (2-tailed)	.000	.000	.000		.000	.000	.000
	N	300	300	300	300	300	300	300
Restaurant cleaning	Pearson Correlation	.586**	.670**	.534**	.669**	1	.638**	.668**
	Sig. (2-tailed)	.000	.000	.000	.000		.000	.000
	N	300	300	300	300	300	300	300
Restaurant visits	Pearson Correlation	.554**	.672**	.561**	.656**	.668**	.640**	1
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000	
	N	300	300	300	300	300	300	300

***. Correlation is significant at the 0.01 level (2-tailed).*

Discussion

Factors that influence people's food choices have been widely studied. However, the factors that influence the food choices of university students, and specifically college commuter students, have not been as widely studied. (1- 4) The current study aims to assessing the influencing factors on food choices from university cafeterias among basic medical sciences students in Faculty of Public Health. Sample size is 300 students. 6.3 % of the sample (n = 19) are males and females are (n = 281) representing 93.7 % of the total sample. The mean age (± SD) for both the genders is 19.4 ± 2.2. The first year students make (72.33%) of the total sample; while the second year make students are (27.67%). (62.67%) of the students live in families with members seven and more. (32%) of the students live in families with 4 to 6 members. (62.69%) of the participants have family income between 1000 - 3000 Libyan Diner (LD).Food choices are central as they could help create and develop the demand from the customers to the suppliers, which are the party that produces, process and distributes food. Therefore, to attract the students to dine in at the cafeteria, the on campus foodservice operator needs to know the consumers' preferences and seek how to satisfy them. Consequently, understanding students' food choices will benefit foodservice operators to make effective decisions, develop quality products, and contribute to healthier eating habits among students. In a higher education environment, students and staff usually spend much time on campus, and campus food providers play an imperative role in shaping their eating habits [34]. (43.67%) of participants agreed that food size is an important factor. In another study by Baguio TKF et al (2019); (44.2%) of participants agreed that food size is an important factor [35]. Similarly, (46.33%)

Razi Med J. 2025;1(4):288-298
https://doi.org/10.69667/rmj.25402
Razi Medical Journal
https://razi.edu.ly/rmj/index.php/hm

of students agree that food shape is significant factor. In another study by Blešić, Ivana, et al. (2018); 62% of participants agree that food shape is significant factor [36].
Regarding food color, (46%) of the students agree on its importance. Human perception is significantly influenced by color, prioritizing it at 80% over shape [37]. Regarding food flavor; (52%) of the subjects strongly agree. In study done by Serhan M et al (2019); food flavor was detected very agreeing by (5.2%) of student. This result is very low comparing to the current study [38]. In terms of food texture, (39%) of students agree on its importance. In study done by Wallace M et al (2023); (60%) of participants agree on its importance.(39) Regarding food odor, (51%) of participants strongly agree. Similar result was obtained by Sarikahya M et al (2021);. (47.7%) of their sample was strongly agree regarding food odor [40]. Regarding food freshness, (48.33%) of participants strongly agree. Very low percentage comparing to the current study was obtained by Raihen M et al (2023). Only (4.8%) of student were very satisfied regarding food freshness [41]. In terms of food price, (36.33%) of participants agreed. One of the main factors that affect the food choice in Oliveira, L et al (2024); study is food price. They indicated that (47.4%) agree that price is important factor in food choices [42]. The presence of menu is agreed by (46.67%) of students. In another study by Ismail H et al (2024); the menu attributes included in the analysis collectively account for 55.1% of the variability in students' purchase decisions [43]. Availability of food items is agreed by (32.67%). In another study by Raihen, M.N (2023); only (20.2%) of participants agreed [44]. Regarding temperature, (40.67%) of students agree. In study done by Serhan M et al (2019); 46% of student agreed [38] For noise levels, (29.33%) of students strongly agree. In another study by Sarikahya, M et al, (2021); 58.4% of students strongly agree [40]. Concerning odor, (50%) of participants strongly agree. Smells nice was agreed by (83.8%) of students in study by Martinez-Perez, N., et al (2022) [44]. Regarding planning and decoration, (33.67%) of participants agree. Appropriateness of the decor in dining hall satisfied by (52.4%) in a study by Hall, J.K., (2013) [45]. Regarding cafeteria cleanliness, (63.33%) of participants strongly agree. In a study by Suvittawat, A. et al, (2024); it was agreed by (18.2%) [46]. For work hours, (41.67%) of participants agree. A double percentage (81%) was obtained in study by Mauramo, E., et al (2025) [48]. (40.67%) of students visit university restaurants 1-2 times a week. In another study by Czarniecka-Skubina, E (2019); a large group of consumers (35.5%) used canteens systematically, at least once a week or daily. Others used canteens 2–3 times (18.6 %) [48]. This study contributed to the existing knowledge of the factors that influence the food choices of college students and provides a starting point for research in the college commuter student population. Food choices were found to be significantly more food cleaning, food odor, price, menu, cafeteria cleaning , with the dependent variable (cafeteria visits). It shows significance between independent variables and dependent variables at 0.01 levels, two- tailed toward cafeteria visits. Food odor shown a strongest relationship at (r= 0.672). Cafeteria cleaning is second at 0.668; while menu is at 0.656. Surrounding and cleanliness was at 0.640. These results also were confirmed in previous studies including Sarikahya M et al (2021); Oliveira, L et al (2024); Ismail H et al (2024); Martinez-Perez, N., et al (2022); and Suvittawat, A. et al, (2024).

Conclusion

Factors that influence people's food choices have been widely studied. However, the factors that influence the food choices of university students, and specifically college commuter students, have not been as widely studied. The current study aims to assess the influencing factors on food choices from university cafeterias among basic medical sciences students in the Faculty of Public Health. Sample size is 300 students. 6.3 % of the sample (n = 19) are males and females are (n = 281), representing 93.7 % of the total sample. The mean age ($\pm$ SD) for both the genders is 19.4 $\pm$ 2.2. Food size, shape, color, flavor, and odor are the variables that affect students food choices in this study. Temperature, air quality, noise levels, odor, and cafeteria cleanliness are the cafeteria variables that affect students food choices in this study. The results of the current study support the following recommendations: further research should be conducted in order to determine effective nutrition promotion strategies that can be targeted at the specific factors affecting the food choices of college commuter students. Nutrition interventions should be tailored to meet the needs of college commuter students by educating them on how to eat healthy on a limited budget and with a minimal amount of time for food preparation. Connections with other bodies such as ministry of education and other agencies are crucial to improve the students food choices.

Acknowledgments
Authors like to express sincere gratitude to participants for their time and willingness to contribute to this research.

Funding
This research received no specific grant.

Authors' contributions
This work was carried out in collaboration between all authors. Author Faiza Nouh developedthe idea. Authors Faiza Nouh, Salima Elfagi, and Mohamed H Buzgeia participate in conceptualization. Authors Ahlam Adel, Mawadda Salah, Enas Hassan, and Safa Edress collected the data, analysed the data, did a literature review, and wrote the original draft of the manuscript. Authors Faiza Nouh and Salima Elfagi reviewed and edited the manuscript. Authors Faiza Nouh, Salima Elfagi, and Mohamed H Buzgeia read and approved the final manuscript.

Conflict of interest
The authors have declared that no competing interests exist.

Data availability
The data that support the findings of this study are not openly available due to reasons of sensitivity and are available from the corresponding author upon reasonable request.

References

1. Omar M, Nouh F, Ali S, Younis M, Younis M, Faraj E, Mousa E. Food habits, eating behaviour, and body mass index of Benghazi University students. Sch J Appl Med Sci. 2018;6(5):1957-63.
2. Larson N, Story M. A review of environmental influences on food choices. Ann Behav Med. 2009;38 Suppl 1:s56-73.
3. Povorozniuk I, Neshchadym L, Lytvyn O, Berbets T, Filimonova I, Zotsenko L, et al. Modelling of demand determinants for full-time bachelor's degree programs in hospitality and catering: the case of Ukrainian higher education institutions. Int J Comput Sci Netw Secur. 2022;22(1):347-57.
4. Aithal PS, Kumar PM. Catering student enrollment and retaining diversity in higher education institutions. Int J Eng Res Mod Educ. 2016;1:565-77.
5. Medeiros CO, Salay E. A review of food service selection factors important to the consumer.
6. Gonzalez R, Gasco J, Llopis J. Information and communication technologies in food services and restaurants: a systematic review. Int J Contemp Hosp Manag. 2022;34(4):1423-47.
7. Shadiyev AK. Development and organization catering service in hospitality. Academicia. 2021;11(5):381-7.
8. Chung JC, Huang YF, Weng MW, Lin JC. The sustainable innovation design in catering service. Sustainability. 2021;14(1):278.
9. Malinowska E, Tarczyńska AS, Urbanowicz A. Factors determining the quality of catering services in the opinion of consumers and catering staff.
10. Kalenjuk-Pivarski B, Tekić D, Šmugović S, Banjac M, Novaković A, Mutavdžić B, et al. Factors affecting the consumption of traditional food in tourism—perceptions of the management sector of catering facilities. Foods. 2023;12(12):2338.
11. Jin W, Zhi G, Zhang Y, Wang L, Guo S, Zhang Y, et al. Toward a national emission inventory for the catering industry in China. Sci Total Environ. 2021;754:142184.
12. Naicker A, Shrestha A, Joshi C, Willett W, Spiegelman D. Workplace cafeteria and other multicomponent interventions to promote healthy eating among adults: a systematic review. Prev Med Rep. 2021;22:101333.
13. Saygi YB, Shipman ZD. Factors affecting food selection and new trends in consumer food behaviour. EURAS J Eng Appl Sci. 2021;1(1):37-52.
14. Yan MR, Hsieh S, Ricacho N. Innovative food packaging, food quality and safety, and consumer perspectives. Processes. 2022;10(4):747.
15. Li X, Braakhuis A, Li Z, Roy R. How does the university food environment impact student dietary behaviors? A systematic review. Front Nutr. 2022;9:840818.
16. Caruso OT, Schaafsma HN, McEachern LW, Gilliland JA. The campus food environment and postsecondary student diet: a systematic review. J Am Coll Health. 2025;73(2):577-601.
17. Singh A, Nanda P. Comparing factors influencing loyal consumption behavior towards fast-food restaurants. Indian J Mark. 2022;52(6):41-58.

18. Horng JS, Hsu H. Esthetic dining experience: the relations among aesthetic stimulation, pleasantness, memorable experience, and behavioral intentions. J Hosp Mark Manag. 2021;30(4):419-37.
19. Varanese JD. Re-think cleanliness: transformative perspectives within radical design.
20. Sambo E, Ukpata IS, Atiga MM, Fumba J. Impact of product quality on customer satisfaction and loyalty. Niger Acad Manag J. 2022;17(2):145-55.
21. McClements DJ, Weiss J, Kinchla AJ, Nolden AA, Grossmann L. Methods for testing the quality attributes of plant-based foods: meat- and processed-meat analogs. Foods. 2021;10(2):260.
22. Spence C, Motoki K, Petit O. Factors influencing the visual deliciousness/eye-appeal of food. Food Qual Prefer. 2022;102:104672.
23. Slack NJ, Singh G, Ali J, Lata R, Mudaliar K, Swamy Y. Influence of fast-food restaurant service quality and its dimensions on customer perceived value, satisfaction and behavioural intentions. Br Food J. 2021;123(4):1324-44.
24. de Almeida Costa AI, Monteiro MJP, Lamy E, editors. Sensory evaluation and consumer acceptance of new food products: principles and applications. Vol. 43. London: Royal Society of Chemistry; 2024.
25. Muniandy ND, Yusoff FA, Dewi ADA. Effect of food intake on mood in higher education institute students in Malaysia. Environ Behav Proc J. 2024;9(28):11-7.
26. Racine EF, Schorno R, Gholizadeh S, Bably MB, Hatami F, Stephens C, et al. A college fast-food environment and student food and beverage choices: developing an integrated database to examine food and beverage purchasing choices among college students. Nutrients. 2022;14(4):900.
27. Fogolari N, Souza AD, Bernardo GL, Uggioni PL, Oliveira RC, Rodrigues VM, et al. Qualitative menu labelling in university restaurants and its influence on food choices: a systematic review and synthesis without meta-analysis. Nutr Bull. 2023;48(2):160-78.
28. Lorenzoni V, Triulzi I, Martinucci I, Toncelli L, Natilli M, Barale R, et al. Understanding eating choices among university students: a study using data from cafeteria cashiers' transactions. Health Policy. 2021;125(5):665-73.
29. El-Mani SF, Mansour RM, Abdessamad AE, Al-Abbar EA, Shallouf N, Amer R. Factors influencing eating behavior of Benghazi University students. Asian J Med Sci. 2020;11(4):20-9.
30. Mensah DO, Yeboah G, Batame M, Lillywhite R, Oyebode O. Type, density, and healthiness of food-outlets in a university foodscape: a geographical mapping and characterisation of food resources in a Ghanaian university campus. BMC Public Health. 2022;22(1):1912.
31. Zhong Y, Moon HC. What drives customer satisfaction, loyalty, and happiness in fast-food restaurants in China? Perceived price, service quality, food quality, physical environment quality, and the moderating role of gender. Foods. 2020;9(4):460.
32. Kabir A, Miah S, Islam A. Factors influencing eating behavior and dietary intake among resident students in a public university in Bangladesh: a qualitative study. PLoS One. 2018;13(6):e0198801.
33. Bidin N, Khushmee WNAWH, Mohamed M, Jalis MH, Bakar AMFA, Kassim ARA. Factors affecting food choice among university students in Malaysia. Asian J Res Educ Soc Sci. 2024;6(S1):103-17.
34. Abd Karim N, Abdullah R, Zalani IL, Lokman NFNA, Ali FM. Food choice preferences: a study on university cafeterias' food in Terengganu. Int J Bus Technol Manag. 2023;5(S1):179-90.
35. Baguio TKFG, Naelga SC. The impact of food service attributes on customer satisfaction: the case of cafeteria services at a state university of northern Mindanao. Cad Educ Tecnol Soc. 2024;17(1):339-50.
36. Blešić I, Raljić JP, Pivac T, Ivkov M. Factors influencing students' choice of fast food restaurants. Ekonomika Poljoprivrede. 2018;65(1):257-68.
37. Su J, Wang S. Influence of food packaging color and food type on consumer purchase intention: the mediating role of perceived fluency. Front Nutr. 2024;10:1344237.
38. Serhan M, Serhan C. The impact of food service attributes on customer satisfaction in a rural university campus environment. Int J Food Sci. 2019;2019(1):2154548.
39. Wallace M, O'Hara H, Watson S, Goh AT, Forde CG, McKenna G, et al. Combined effect of eating speed instructions and food texture modification on eating rate, appetite and later food intake. Appetite. 2023;184:106505.
40. Sarikahya M. The influence of the interior design of the cafeterias on the satisfaction evaluation by the students. Online J Art Des. 2021;9(2).
41. Raihen MN, Akter S, Sardar MN. Food satisfaction among students: a study of present public university students in Bangladesh. J Math Stat Stud. 2023;4(1):1-18.
42. Oliveira L, BinMowyna MN, Alasqah I, Zandonadi RP, Teixeira-Lemos E, Chaves C, et al. A pilot study on dietary choices at universities: vending machines, canteens, and lunch from home. Nutrients. 2024;16(11):1722.
43. Ismail H, Abdullah DNA, Noor Rizian ATNF, Rasul R, Md Zain NA. Menu attributes and students' purchase decision: a case of Tealive. J Tourism Hosp Culin Arts. 2024;16(1):880-9.

44. Raihen MN, Akter S, Sardar MN. Food satisfaction among students: a study of present public university students in Bangladesh. J Math Stat Stud. 2023;4(1):1-18.
45. Martinez-Perez N, Telleria-Aramburu N, Insúa P, Hernández I, Telletxea S, Ansotegui L, et al. On-campus food purchase behaviors, choice determinants, and opinions on food availability in a Spanish university community. Nutrition. 2022;103:111789.
46. Hall JK. Student satisfaction regarding meal experience at the residential dining halls of the University of Pretoria [dissertation]. Pretoria: University of Pretoria; 2013.
47. Suvittawat A, Suvittawat N. Influential factors on clean food purchasing decisions: a case study of consumers in the lower northeastern region of Thailand. World. 2024;5(3):683-99.
48. Mauramo E, Salmela J, Kanerva N, Raulio S, Lallukka T. Having lunch at the staff canteen and plant food consumption among 19–39-year-old Finnish employees. BMC Public Health. 2025;25(1):1237.
49. Czarniecka-Skubina E, Górska-Warsewicz H, Laskowski W, Jeznach M. Consumer choices and service quality in the university canteens in Warsaw, Poland. Int J Environ Res Public Health. 2019;16(19):369.