



Research article

Social and psychosocial factors affecting eating habits among students studying at the Syrian Private University: A questionnaire based cross-sectional study



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ABSTRACT

Syrian eating habits are trending towards westernized patterns that are high in carbohydrates, fats, and meat. This accompanied by an increasingly sedentary lifestyle has affected young adults' dietary habits. As a consequence, obesity and overweight young adults are significantly increasing in prevalence. This study aims to assess the pattern of eating habits and their relation with psychosocial factors among university students.

A cross-sectional study was conducted among Syrian Private University students using a self-administrated questionnaire. The questionnaire consisted of 3 sections: socio-demographic characteristics, eating habits, and psychosocial factors. Each item from the eating habits questionnaire was scored "1" if the response was healthy or "0" if the response was unhealthy. All items were summed and the total score was obtained for each student. Students' scores were summed and divided by the total number of students to deduce the total mean of eating habits. Hierarchical multivariate linear regression was used to evaluate factors associated significantly with eating habit score and psychological factors.

Of 728 students included in the study 398 (54.7%) were females. Overweight and obese participants represented 154 (21.4%) and 49 (6.8%) respectively. Around 316 (43.4%) were smokers and 135 (18.5%) drank alcohol. Only 259 (36.0%) students reported they adopted healthy eating habits. Of them, 233 (32%) and 306 (42%) ate meals and breakfast regularly respectively. Participants' had a moderate eating habits score; the mean total was 5.96 (SD $\pm$ 1.95). Multivariate analysis revealed that non-smokers ($p < 0.001$), exercising ($p = 0.002$), living with family ($p < 0.001$), and eating because of feeling happy ($p = 0.014$) were factors significantly associated with eating habits score and psychological factors. While R^2 adjusted were 0.109 and 0.117 in the first and second model, the total model accounted for 13.2% of variance.

Half of the students demonstrated unhealthy eating habits. The identified socio-demographic and psychological factors were significantly affecting students' eating habits. These findings can be used to provide targeted lifestyle modification advice via health promotion programs towards these specific groups.

1. Introduction

The new introduction of "Western food", shifting from a healthy Mediterranean cuisine towards an outstripped domestic production of unhealthy deep-fried junk, has had its toll on many countries including Syria. Unhealthy lifestyles and poor eating habits are among the leading causes for developing obesity and non-communicable diseases (NCD) such as type 2 diabetes, cardiovascular disease, and cancer [1, 2]. NCD,

responsible for 36 million deaths/year, is the prime reason for morbidity and mortality worldwide [3]. In 2010, an estimated 472.7 males and 326.2 females per 100,000 died from cardiovascular diseases and 65.7 males and 47.2 females per 100,000 died from cancers in Syria [4].

Alarming, chronic diseases are now affecting younger generations [5]. The transition from school to university presents new challenges for students' diet and lifestyle habits. University life is a critical period where lifelong lifestyle habits are established, choosing the wrong habits will

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have long-term impacts on the development of chronic diseases in the future [6]. Moreover, young adults are prone to obesity [7], and many students gain weight during the transition to higher education [8, 9]. Several changes in physical growth and psychological development make young students a nutritionally vulnerable group that neglects to meet the dietary requirements [10, 11, 12]. Environmental and social factors may lead to unhealthy eating habits, for example, students tend to adopt unhealthy eating patterns including skipping meals, disfavor homemade food, snack, opt for cheap quick food, and consume fast food [11, 12, 13]. This raises health concerns when unhealthy habits obtained at this young period remain in later adult life [14, 15]. The poor eating habits acquired in university life have been attributed to stress, high workload, and tight schedules [16]. Psychological factors such as bad coping strategies during stressful situations including university exams have been found to seriously damage students' eating behaviors [17, 18]. Studies among medical students have highlighted inadequate eating habits and their relation to university stress [19, 20]. Therefore, promoting healthy eating habits across young people is essential to ensure healthy wellbeing [10]. Raising awareness regarding healthy eating diets through university nutritional campaigns has been advised to prevent NCD [21, 22].

During the Syrian war, a massive downfall in the agricultural sector was recorded. Different factors contributed to this collapse. Many lands/regions/governorates had been taken from government control, and bombed, rendering them unsuitable for cultivation. The shortage of electricity, the imposed sanctions, and the destruction of infrastructure by the terrorist attacks also contributed to the collapse of Syria. All the above have resulted in the decrease of the agricultural labor force forcing local farmers to emigrate from the country. In 2014 wheat and olive production marked a great reduction by 47.53% and 64.18% respectively [23]. This severely affected Syrian nutritive intake where 12.4 million people are food insecure, and 1.3 million are severely food insecure [24].

While some studies have been conducted to assess eating habits and dietary intake among countries in the Middle East [19, 25], only a few studies focused on the dietary intake of adolescents in Syria [26, 27]. The Syrian studies revealed bad eating habits such as skipping breakfast, binge night eating, and an inadequate intake of fruits, vegetables, meat, and dairy products [26, 27]. The objectives of this study are to evaluate the association of eating habits with socio-demographic characteristics and to identify factors associated with eating habits, and psychological factors among students in a Syrian university.

2. Methods

2.1. Study setting, and participants

This online cross-sectional study was conducted in December 2020 using a convenience sampling method among university students of the Syrian Private University (SPU) in Damascus, Syria. Students were asked to participate voluntarily. Written informed consent was obtained from all participants. They were informed that all of their responses were recorded anonymously, response to all questions was not mandatory, and were allowed to opt-out of the survey at any time. Included participants were Syrian undergraduate students, 18 and older, and studying at SPU. The aims and objectives of the study were explained to students in a written form attached to the questionnaire. The sample size calculated was 357 based on a margin of error of 5%, and a confidence interval of 95%, for a population of 5,000 students using a sample size calculator. The research hypothesis is that university students' eating habits are significantly associated with socio-demographic and psychological factors. Ethical approval was obtained from the Institutional Review Board (IRB), Faculty of Medicine, Syrian Private University.

2.2. Study instruments

A self-administered self-completed English-language validated questionnaire on eating habits was randomly distributed among SPU

students. SPU students study an English-based curriculum. The survey was adopted from previously published studies [19, 20, 25]. Reliability was assessed at Cronbach's alpha 0.715. The questionnaire contained 3 sections:

- 1- Socio-demographic information included 10 questions on age, gender, faculty, marital status, financial status, living circumstances, body mass index (BMI), smoking status, alcohol consumption, and exercise.
- 2- Eating habits and type of meals consumed included 11 questions [20].
- 3- Psychological factors that influence the dietary eating habits of respondents were assessed using a 6-item scale. The validated compulsive eating scale (CES) was used to measure uncontrolled eating patterns among university students [28].

2.3. Statistical analysis

Data were analyzed using the Statistical Package for Social Sciences version 25.0 (SPSS Inc., Chicago, IL, United States) and reported as frequencies and percentages (for categorical variables) or means and standard deviations (SD) (for continuous variables). The BMI was calculated as weight in kilograms divided by height in square metres (kg/m^2). Students' BMI were divided into 4 groups: $< 18.5 \text{ kg}/\text{m}^2$ was categorised as underweight, $18.5\text{--}24.9 \text{ kg}/\text{m}^2$ was categorised as healthy weight, $25\text{--}29.9 \text{ kg}/\text{m}^2$ was categorised as overweight, and $>30 \text{ kg}/\text{m}^2$ was categorised as obese. Each item of eating habits was scored [1] if the response was healthy or (0) if unhealthy. All items were summed and the total score was obtained (minimum = 0 and maximum = 10). Thus, a higher score on eating habits indicated better eating habits. Students' scores were summed and divided by the total number of students to deduce the total mean of eating habits. Throughout the analysis the mean eating score was the outcome variable (continuous) and the socio-demographic variables were the independent variable (categorical). Chi-square test was applied to determine if the sample followed a normal distribution. The t-test was applied to compare the mean eating score against socio-demographic variables (gender, faculty, marital status, exercise, and alcohol consumption) and psychological factors. One-way analysis of variance (ANOVA) was applied using f-test to compare mean eating scores against socio-demographic variables (study year, financial status, living circumstances, BMI, and smoking status). Hierarchical multivariate linear regression was used to evaluate factors associated significantly with eating habit score. Age, faculty, smoking, drinking alcohol, exercise, and accommodation status were entered in the first step. In the second step, psychological factors affecting eating behavior were entered. A hierarchical linear regression was used to analysis multiple variables within a model, to see whether adding variables significantly improves a model's ability to predict the criterion variable (eating scores) and to investigate a moderating effect of a variable (psychological factors). Multicollinearity was checked between independent variables. Statistical significance was set at $p < 0.05$.

3. Results

3.1. Socio-demographic characteristics

Out of 1000 students invited to participate, 728 filled the questionnaire, with a response rate of (72.8%), of which, 330 (45.3%) were males, and 398 (54.7%) were females ($p = 0.012$). Most of the participants were from the medicine 235 (32.3%), pharmacy 187 (25.7%), and dentistry 128 (17.6%) faculties ($p < 0.001$). Second year students 183 (25.1%) represented a majority, whereas third year students 103 (14.1%) represented a minority ($p < 0.001$). The majority were single 606 (83.2%) and living with their family 564 (77.5%) ($p < 0.001$). 387 (53.2%) were non-smokers ($p < 0.001$) and 593 (81.5%) never drank alcohol ($p < 0.001$). 268 (36.8%) participated in sporting activities 1–2 times/week, while 266 (36.5%) had never practiced sport ($p < 0.001$).

Table 1. Socio-demographic characteristics of respondents: (n = 728).

	Count (%)	Chi-Square	p value
Gender			
Male	330 (45.3)	6.352	0.012*
Female	398 (54.7)		
Faculty			
Medicine	235 (32.3)	238	<0.001
Dentistry	128 (17.6)		
Pharmacy	187 (25.7)		
Information technology	66 (9.1)		
Petroleum engineer	55 (7.6)		
Business administration	57 (7.8)		
Year of study			
1 st	116 (15.9)	80.121	<0.001
2 nd	183 (25.1)		
3 rd	103 (14.1)		
4 th	131 (18.0)		
5 th	144 (19.8)		
6 th	51 (7.0)		
Place Accommodation			
With family	564 (77.5)	641.887	<0.001
With friends	61 (8.4)		
Alone	103 (14.2)		
Marital status			
Single	606 (83.2)	836.607	<0.001
In relationship	111 (15.2)		
Married	11 (1.5)		
Financial status			
Bad	4 (0.5)	783.25	<0.001
Below average	21 (2.9)		
Average	204 (28.0)		
Good	413 (56.7)		
Excellent	86 (11.8)		
Smoking			
Smokers	316 (43.4)	303.25	<0.001
Previous smoker	25 (3.4)		
Don't smoke	387 (53.2)		
Alcohol drinking			
Yes	135 (18.5)	778.041	<0.001
Practicing sport (per week)			
3 or more times	194 (26.6)	158.791	<0.001
Less than 3 times	534 (73.3)		

593 (81.5%) reported sleeping between 6 to 10 h daily. The majority 443 (61.7%) were within the healthy BMI range, 154 (21.4%) were overweight, 72 (10.0%) were underweight, and 49 (6.8%) were obese ($p < 0.001$) (Table 1) (Figure 1).

3.2. Eating habits

Only 259 (36.0%) students reported they adopted healthy eating habits compared with 469 (64%) students who adopted unhealthy eating habits ($p < 0.001$). Students who ate regular meals, and breakfast represented 233 (32.0%), and 422 (57.9%) respectively ($p < 0.001$). The majority 508 (69.8%) of participants ate their meals without having snacks for 3 or more times/week, and 220 (30.2%) had snacks more than 3 times/week ($p < 0.001$).

The majority consumed vegetables and fruits regularly, 471 (64.7%) and 419 (57.6%) respectively compared with those who did not consume vegetables and fruits ($p < 0.001$). Only 232 (31.8%) reported having fried food 3 or more times/week compared with those who have fried food 3 or less times/week ($p < 0.001$). Unfortunately, most participants 497 (68.2%) drank less than 2 L of water/day compared with those who drank 2 or more liters of water/day ($p < 0.001$). A majority 565 (77.6%) ate food with family and friends for 3 or more times/week compared with those who ate with family and friends less than 3 times/week ($p < 0.001$). Almost all participants 652 (89.6%) knew the importance of eating a well-balanced diet (meat, vegetables, and others), while only 44 (6.0%) and 18 (2.5%) reported eating mainly vegetables and mainly meat respectively ($p < 0.001$) (Table 2).

3.3. Psychological factors affecting eating behavior

Surprisingly 309 (42.1%) students ate because of feeling lonely ($p < 0.001$), 314 (43.1%) felt out of control with regards to food ($p < 0.001$), and 320 (43.6%) ate until they felt their stomach hurts ($p < 0.001$). When asked if their mood affected their eating behavior, 235 (32.3%), 476 (65.4%), and 535 (73.5%) ate because of feeling nervous/upset, bored, and happy respectively ($p < 0.001$) (Table 2).

3.4. Association between eating habits and socio-demographic characteristics

The mean total score of eating habits for all participants was 5.96 (± 1.95), ranging between 0 and 10. The mean eating score was compared with socio-demographic characteristics. A series of one way ANOVA analyses and t-test analysis revealed that mean eating scores differed significantly across the study year ($p = 0.037$), accommodation status ($p < 0.001$), practicing sport ($p = 0.001$), and smoking ($p < 0.001$).

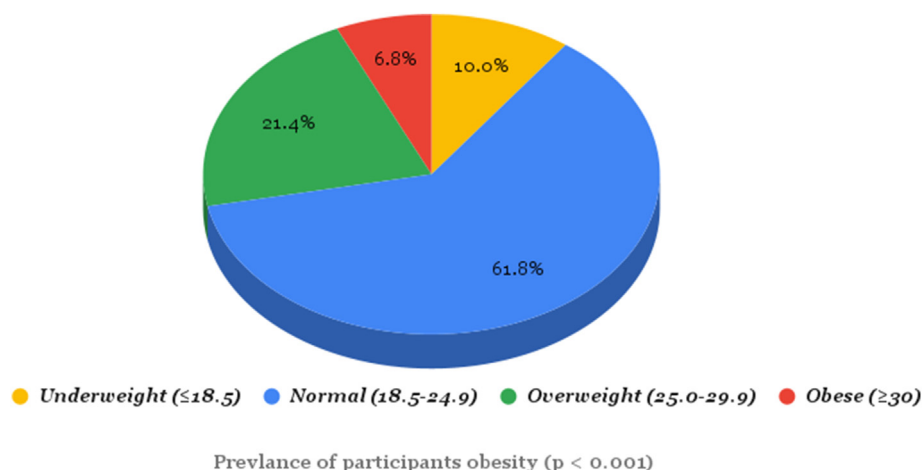


Figure 1. Pie Chart illustrate the Prevalence of obesity among students based on BMI.

Table 2. Eating habits among respondents: (n = 728).

		Count (%)	Chi-Square	p value
Practicing healthy eating habits?	Yes	259 (36.0)	56.672	<0.001
Eating regular meals	Yes	233 (32.0)	94.291	<0.001
Frequency of having daily breakfast	less than 3	306 (42.0)	18.484	<0.001
	3 or more	422 (57.9)		
Frequency of having meals without snacks in between	less than 3	220 (30.2)	113.934	<0.001
	3 or more	508 (69.8)		
Frequency of having snacks	less than 3	341 (46.9)	2.907	0.088
	3 or more	387 (53.1)		
Weekly consumption of vegetables	less than 3	257 (35.3)	62.907	<0.001
	3 or more	471 (64.7)		
Weekly consumption of fruits	less than 3	309 (42.4)	16.621	<0.001
	3 or more	419 (57.6)		
Weekly consumption of fried food	less than 3	496 (68.1)	95.736	<0.001
	3 or more	232 (31.8)		
Water intake (liters/day)	2 and more	231 (31.7)	97.192	<0.001
	Less than 2	497 (68.2)		
Meals with family and friends	less than 3	163 (22.4)	221.984	<0.001
	3 or more	565 (77.6)		
Food type with balanced nutrition	Mainly meat	18 (2.5)	1621.231	<0.001
	Mainly vegetables	44 (6.0)		
	Meat, vegetables, and others	652 (89.6)		
	others	14 (1.9)		
Psychological factors affecting eating habits among respondents				
Eat because of feeling lonely	Yes	309 (42.1)	16.621	<0.001
Feel completely out of control when it comes to food	Yes	314 (43.1)	13.736	<0.001
Eat so much until stomach hurts	Yes	320 (43.6)	10.637	0.001*
Eat because of feeling upset or nervous	Yes	235 (32.3)	91.434	<0.001
Eat because of feeling bored	Yes	476 (65.4)	68.923	<0.001
Eat because of feeling happy	Yes	535 (73.55)	160.665	<0.001

Students in the sixth year had the highest score 6.55 (± 2.24) compared with other year group mean scores, while students in the fifth year had the lowest score 5.67 (± 2.08) compared with other year group mean scores ($p = 0.037$). Students living with their families 6.26 (± 1.89) showed a higher mean score compared to those living with friends 5.16 (± 1.73) or alone 4.81 (± 1.85) ($p < 0.001$). Students practicing sports >3 times/week 6.37 (± 1.93) showed higher scores than those who played

Table 3. Association between eating habits score and participants' characteristics (one way ANOVA and t-test): (n = 728).

Categorical variable		Mean ($\pm$ SD)	f-test/t-test	p-value
Gender	Male	6 (1.99)	0.519	0.604
	Female	5.92 (1.91)		
Faculty	Medical	5.98 (1.96)	0.472	0.637
	Non-medical	5.9 (1.92)		
Year of study	1st	6.2 (19.20)	2.377	0.037*
	2nd	5.86 (1.90)		
	3rd	6.16 (1.76)		
	4th	5.81 (1.87)		
	5th	5.67 (2.08)		
	6th	6.55 (2.24)		
Place of Accommodation	With family	6.26 (1.89)	32.173	<0.001*
	With friends	5.16 (1.73)		
	Alone	4.81 (1.85)		
Financial status	¹ Bad	5.16 (1.60)	2.685	0.069
	² Average	5.87 (1.84)		
	³ Good	6.03 (2.00)		
Marital status	Single	5.99 (1.95)	1.017	0.309
	In relationship	5.8 (1.94)		
Practicing sport	3 or more times	6.37 (1.93)	3.467	0.001*
	Less than 3 times	5.81 (1.94)		
Do you smoke	Yes	5.59 (2.02)	68.151	<0.001*
	Previous smoker	6.08 (1.55)		
	Don't smoke	6.25 (1.86)		
Do you drink alcohol	Yes	5.87 (2.16)	0.559	0.576
	No	5.98 (1.90)		
BMI (Kg/m ²)	Underweight (≤ 18.5)	5.99 (1.73)	1.409	0.239
	Normal (18.5–24.9)	5.89 (2.00)		
	Overweight (25.0–29.9)	6.23 (1.77)		
	Obese (≥ 30)	5.73 (2.13)		

¹ Bad: income does not provide essential needs for the family.

² Average: income provides essential needs for the family but no more.

³ Good: income provides essential needs and luxury requirements.

sports <3 times/week 5.81 (± 1.94) ($p = 0.001$). Students who never smoked 6.25 (± 1.86) had higher mean scores than current smokers 5.59 (± 2.02) and previous smokers 6.08 (± 1.55) ($p < 0.001$) (Table 3).

Table 4. Association between eating habits score and psychological factors: (n = 728).

Psychological factors	Mean ($\pm$ SD)		t-test	p-value
	Yes	No		
Eat because of feeling lonely	5.91 (1.99)	5.99 (1.92)	-0.549	0.580
Feel completely out of control when it comes to food	5.84 (1.84)	6.05 (2.03)	-1.424	0.150
Eat so much until stomach hurts	5.77 (1.85)	6.11 (2.02)	-2.034	0.020*
Eat because of feeling upset or nervous	6.01 (1.99)	5.93 (1.93)	0.516	0.600
Eat because of feeling bored	6.05 (1.88)	5.79 (2.06)	1.706	0.080
Eat because of feeling happy	6.07 (1.96)	5.66 (1.89)	2.467	0.010*

3.5. Association between eating habits and psychological factors

The mean score of eating habits was compared with those who answered “yes” or “no” on psychological factors questions. No significant difference was found between those who ate because of feeling lonely (mean score = 5.91 ± 1.99), and those who did not (mean score = 5.99 ± 1.92) ($p = 0.580$).

Students who answered “no” when asked if they ate until their stomach hurts had a significantly higher (mean score = 6.11 ± 2.02) than those who answered “yes” (mean score = 5.77 ± 1.85) ($p = 0.020$). Students who ate because of feeling happy had healthier eating habits than those who did not (mean score = 6.07 ± 1.96) and (mean score = 5.66 ± 1.89) respectively ($p = 0.014$) (Table 4).

3.6. Factors associated with eating habits in the hierarchical multiple linear regression factors

Socio-demographic variables entered in the first step were age, faculty, smoking status, alcohol consumption, exercise, and accommodation. In the second step, psychological factors were entered: “eat because of feeling lonely”, “feel out of control when eating”, “eat so much until stomach hurts”, “eat because of feeling upset or nervous”, “eat because of feeling bored”, and “eat because of feeling happy”. In the first step non-smokers ($p < 0.001$), exercise ($p = 0.002$), and living with family ($p < 0.001$) were factors significantly associated with higher eating habits scores ($R^2 = 0.118$; R^2 adjusted = 0.109). While in the second step results indicated that non-smokers ($p < 0.001$), exercise ($p = 0.007$), living with

family ($p < 0.001$), and “eat because of feeling happy” ($p = 0.014$) were associated with higher eating habits score ($R^2 = 0.132$; R^2 adjusted = 0.117). The total model was significant ($p < 0.001$) and accounted for 13.2% of the variance (Table 5).

4. Discussion

Our results revealed that only 32% of students ate regular meals daily. This is lower compared with undergraduates from China (83.6%), Lebanon (61.4%), Malaysia (57.6%), and Saudi Arabia (50.5%). The urge to change these irregular eating habits through health promotion programs is well-recommended in the literature [19, 20, 25].

Breakfast is substantially known as the most important meal of the day [29]. Skipping breakfast was found to cause obesity due to over-eating in the next meal and hence raise the risk of type 2 diabetes mellitus [30]. Additionally, daily breakfast consumption is recommended for those with a tight university schedule [31]. In this study, only 32.4% ate breakfast daily. This result shares similarities with Saudi Arabia (34.7%) and Lebanon (31.8%) [19, 25]. However, our result is higher than Nigeria (23.0%) and Jordan (18.6%) [32, 33], but much lower than Malaysia (75.6%), Selangor (73.6%), Brazil (67.3%), Lebanon (61.5%) [20, 34, 35, 36].

The majority of students (69.8%) ate meals without having snacks in between, while (53.1%) ate snacks at least 3 times a week. This is in line with previous studies in Lebanon (53.2%) and Syria (53%) [25, 26] but higher than studies in Saudi Arabia (26.5%), Malaysia (42.4%), and Nigeria (44.0%) [19, 20, 32]. Constant snacking is a widespread habit adopted by youth [27, 37]. Meanwhile, excessive snack eating may lead to both impairment weight loss and even weight gain [38].

Our results revealed that 64.7% of students consumed vegetables at least three times a week. This finding is higher compared with Saudi Arabian medical students, where only 20.4% ate vegetables daily, but lower than Malaysian medical students (81.8%), who consumed more than three portions of vegetables a week [19, 20]. The majority of respondents (57.6%) consumed fruit at least three times a week, this finding is similar to Malaysia (48.5%), but higher compared with undergraduates from Saudi Arabia (11.9%) [19, 20]. Despite our results, a significant portion of students are not consuming enough vegetables and fruits. This may be due to the unaffordable expenses of buying such food when agriculture has been reduced significantly as a result of war [23].

Merely 31.8% of the students reported eating fast food at least three times a week. This finding is higher than a previous Syrian report where

Table 5. Results of the hierarchical multiple linear regression; factors associated with eating habits score.

Factors	First step				Second step			
	β^1	Beta ²	P-value	R square/Adjusted R Square	β^1	Beta ²	P-value	R square/Adjusted R Square
Age (reference: ≥ 22 years)	-0.116	-0.029	0.404	0.118/0.109	-0.089	-0.023	0.521	0.132/0.117
Faculty (reference: medical faculties)	0.058	0.013	0.720		0.056	0.012	0.729	
Smoking (reference: non-smoker)	0.625	0.160	0.000*		0.593	0.152	$p < 0.001^*$	
Alcohol (reference: no)	-0.269	-0.054	0.151		-0.287	-0.057	0.124	
Sport exercise (reference: yes)	0.488	0.111	0.002*		0.426	0.097	0.007*	
Accommodation (reference: live with family)	1.281	0.275	0.000*		1.280	0.275	$p < 0.001^*$	
Eat because of feeling lonely (reference: no)					0.174	0.044	0.275	
Feel completely out of control when it comes to food (reference: no)					0.218	0.055	0.142	
Eat so much until stomach hurts (reference: no)					0.178	0.045	0.219	
Eat because of feeling upset or nervous (reference: no)					-0.059	-0.014	0.722	
Eat because of feeling bored (reference: no)					-0.071	-0.017	0.675	
Eat because of feeling happy (reference: no)					-0.412	-0.093	0.014*	

The reference group for age is ‘ ≥ 22 years’; for faculty is ‘medical faculties’; for smoking ‘none smokers’; for alcohol ‘no’; for exercise is ‘yes’; for accommodation is ‘with family’; for all other variables is ‘no’.

¹ Unstandardized Coefficients.

² Standardized Coefficients.

14% of adolescents ate fast food at least four times a week [27]. Fast food consumption ranged between 21.2% and 49% among undergraduates [19, 20, 25, 32]. Students choose to eat fast food due to its flavor, easy access, convenience, and low price [39]. Making healthier meals more attainable by young people is necessary when the usual student diet is high in fat [40]. Most participants (77.6%) reported eating with their family or friends more than three times a week. The result is in line with reports from Malaysia (81.8%), Saudi Arabia (78.3%), and Lebanon (76.8%) [19, 20, 25].

ANOVA test and t-test studied the association between eating habits score and participants socio-demographic, which revealed healthier scores in final year undergraduates compared with first year undergraduates. This finding is in accordance with previously reported studies [19, 25]. Students living with family reported healthy eating scores compared with students living alone or with friends. Students who practice regular exercises and have never smoked scored higher than non-athletic students and smokers or ex-smokers. Saudi Arabian medical students also showed higher eating scores in students who live with their family, play sports, and never smoked [19]. These results suggest that following a healthy lifestyle elicits a healthier eating behavior.

In our study, t-test was used to study the correlation between psychological factors and eating habits score. Students who reported yes because they “eat until their stomach hurts” scored lower than those who did not. The finding concurred with previous studies in Saudi Arabia and Malaysia [19, 20]. Reports have shown that unrestrained eating habits among undergraduates indicate compulsive eating behavior [20]. Furthermore, students who reported yes because they “eat when feeling happy” had higher eating habits scores. Other studies reported lower eating scores because of feeling lonely, upset or nervous, and bored among medical students [19, 20]. These suggest that a healthy mental state goes hand in hand with a healthy eating lifestyle.

Although social media have become part of people's lives with a significant impact especially on younger adults, obtaining online health information has a negative effect on attitude toward eating habits [41]. Data on healthy eating diets have become scarce. This study presented many factors affecting eating habits among Syrian undergraduates. These will help understand the causes of adopting unhealthy eating habits and encourage local governments to take strict actions. Measures that must be taken include creating promotional programs on healthy eating, provide an approach to encourage the consumption of healthy, safe, and affordable foods, reduce access to consumption of calorie-dense and nutrient-poor foods, and raise awareness about the importance of healthy eating habits to prevent obesity and NCD.

Like any study, there are a few limitations to be listed. The results of this study are limited to a sample of students from just one university which may not be representative of all university students in Syria. Moreover, students attending SPU are usually of high socioeconomic standards; therefore, samples from different universities may provide a more comprehensive image of university students mulling over financial status. This cross-sectional design of the study does not allow inferences to be drawn about causality, and longitudinal consequences of eating habits can not be assessed.

5. Conclusion

Half of the students had unhealthy dietary habits. The unhealthy habits were irregular meals, inadequate consumption of snacks, and water intake. Students' eating habits were significantly affected by the socio-demographic and psychological factors. Non-smokers, physically active, and living with family students had the healthiest eating habits. Understanding the bad eating habits may help the Syrian public health authorities, university authorities, food providers, and health promotion officers plan out the required nutritional education and actions needed by students across Syria. Actions have been undertaken by a number of countries, for example mandatory labeling of pre-packed for direct foods, requiring most foods to bear nutrition labeling; regulations regarding

beverages and food marketing, taxing sweetened beverages containing over 5g of sugar per 100ml; and institutional and large-scale healthy feeding programs.

Declarations

Author contribution statement

Homam Alolabi, Mhd Obai Alchallah, Fatema Mohsen: Conceived and designed the experiments; Performed the experiments; Wrote the paper.

Marah Marrawi: Analyzed and interpreted the data.

Zaynab Alourfi: Conceived and designed the experiments; Wrote the paper.

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Data availability statement

Data will be made available on request.

Declaration of interests statement

The authors declare no conflict of interest.

Additional information

No additional information is available for this paper.

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