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Research article

# Junk Food Consumption and Obesity Risk Among Students at Benghazi University: A Cross-Sectional Study

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**ABSTRACT**

Consumption of junk food is an environmental factor linked to obesity and may heighten the risk of obesity-related diseases, representing a significant public health issue. The study aim is to clarify the association between junk food consumption and obesity among students at Benghazi University and will also examine students' knowledge of the adverse effects of junk food consumption. A cross-sectional study was conducted among students in the medical colleges of the University of Benghazi from January 2024. A self-administered questionnaire was utilized, including socio-demographic data, patterns of junk food consumption, knowledge about Junk food, and weight and height measurements. A total of 354 students participated in the study, with 67.5% female and 32.5% male. The majority (84.4%) were less than 25 years old. Notably, 98.9% of students consume junk food. 39.5% of students reported consuming junk food once or twice a week. Knowledge assessment revealed that 47.7% had good knowledge, 26.3% had fair knowledge, and 26% had poor knowledge regarding junk food. Based on the Body Mass Index (BMI) classification, 52.8% of participants had a normal BMI, 26.3% were overweight, 13.6% were obese, and 7.3% were underweight. Increased weekly junk food consumption was observed, alongside a high prevalence of overweight and obesity among students, despite a majority having normal BMI. No significant association between junk food consumption and BMI was found. Students acknowledged junk food's negative effects but continued consumption due to emotional factors and taste preference.

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## 1. Introduction:

The global prevalence of overweight and obesity has risen sharply, impacting individuals of all ages, genders, and ethnicities. The prevalence of obesity is considered a significant public health crisis [1] Obesity is a major contributor to non-communicable diseases, such as type 2 diabetes, cardiovascular diseases, certain cancers, and musculoskeletal disorders, as well as other health issues like arthritis, gallbladder disease, and respiratory problems [2; 3]. Environmental factors play a crucial role in this epidemic, and dietary habits have emerged as one of the most influential. The increased consumption of junk food, specifically high-calorie, low-nutrient foods that are readily available, affordable, and convenient, is particularly concerning for its role in obesity [4; 5]. Junk food, including items like chips, sugary drinks, fast food, and other highly processed options, is typically high in calories, fats, sugars, and sodium while offering minimal nutritional value [6]. Often popularized for convenience, flavor, and low cost, these foods are especially appealing to young adults, including university students, who are particularly vulnerable to poor dietary choices due to their unique lifestyle challenges [7] Research shows that students frequently consume fast food and sugary beverages due to time constraints, social influences, and financial limitations, leading to an increase in daily caloric intake [8] For instance a study found that approximately 30% of university students consumed fast food at least once daily, a pattern that significantly raises their energy intake and increases the likelihood of weight gain [9] One factor linking junk food consumption to obesity is its high energy density. Foods like fried snacks and sugary sodas contain more calories per gram than less processed options, contributing to passive overconsumption and promoting weight gain, [10]. Combined with the sedentary behaviors often seen among university students, high-calorie diets create a significant risk for obesity and other metabolic issues [11]. Stress and psychological factors also influence university students' dietary habits. Academic demands, social pressures, and financial concerns contribute to stress, which is associated with an increase in high-calorie, low-nutrient food consumption—a behavior known as "emotional eating" [12]. Wardle et al. found that stress led to increased consumption of calorie-dense and sugary foods among students during high-stress periods, contributing to weight gain [13]. Additionally, social factors such as peer influence and exposure to junk-food advertising play a significant role in dietary choices. In a study, over 50% of university students reported that fast-food restaurants were a regular part of their social activities, further increasing their junk food intake and risk of obesity [14]. The availability and affordability of junk food make it a common choice for students on a budget, exacerbating the problem [15] Physical inactivity among university students adds to the effect of junk food consumption on obesity. Studies show that the combination of frequent junk food intake and low physical activity levels leads to increases in BMI over time [16]. The prevalence of obesity and junk food consumption among students at Benghazi University, along with the limited understanding of the associated health risks, necessitates a comprehensive study to investigate these factors within the Libyan context.

This study aims to investigate the consumption of junk food among Benghazi University students, assessing its association with obesity. It will also examine students' knowledge of the adverse effects of junk food consumption, the frequency of consumption, and the underlying reasons for their choices.

## 2. Methodology:

*2.1 Study setting and Study Populations:*

A cross-sectional study involving students from five colleges within Benghazi University's medical schools was undertaken in January 2024, (Medicine, Public health, Pharmacy, Dental and Oral Surgery, and Biomedical Sciences).

Sample size determined using Solvins Formula Calculator.[17] within margin of error 5% with 95% confidence interval.
From the total students population (n=11,414). The students number in each collage was: 5321 students in Medicine, 2362 in Dental and Oral surgery,1275 students in Pharmacy, 1320 in Public Health, and 1136 in Biomedical sciences. According to the calculated sample size 386 students were selected to participate in the study. However 32 students reject to participate in the study, so the real number of participant was 354. A Convenience sampling method was used, because access was easy and all individuals were encouraged to participate.
**Response rate:** College that have facilitated approval procedure and cooperate with us. Every student who accepted to complete the questionnaire was enrolled in the research.
**Excluded criteria:** The students outside the specified colleges.

### *2.2 Measures:*

A self-administrated questionnaire was used. A pre designed structural questionnaire that translated in Arabic version have been used in the study. A Pilot study was under taken before starting the main data collection of the study ( Number=21). The questionnaire consists of 4 parts:

2.2.1 The first part contained a 11 questions on Socio demographics data: college name, sex , age, educational and occupational level of parents , marital status and economic status. doing exercise and family history of chronic disease and obesity.

2.2.2 The second part contained a 10 questions about junk food consumption: reasons for choosing to eat at fast food, fast food consumption per week, what fast food do they prefer, when do they eat fast food.

2.2.3 The third part contained a 10 questions about junk food knowledge; the questions were categorized as having low, fair, or good knowledge (Knowledge about adverse effects of junk food) to determine the participants' level of expertise. A score of one was assigned to the right response, and a score of zero was assigned to the wrong one. The maximum score was ten, and the minimum was zero. Using Bloom's cut-off categories for the total knowledge score. The level with (80-100%) categories as good knowledge, From ( 60-79%) categories as fair knowledge, and less than 60% categories as poor knowledge [18].

2.2.4 The fourth part section**:** by measuring weight and height. The weight was determined by Lica Italy personal scale (Home scale).Height was determined using Tape measurement. BMI determined according to WHO, BMI classified as below 18.5 is under Wight, from 18.5-24.9 is a Normal weight, from 25-29.9 is a Pre-obese, From 30-34.9 is an Obesity class I, from 35-39.9 obesity class II, and above 40 is an obesity class III [19].

### *2.3 Statistical analysis:*

Descriptive statistics were used to calculate frequency and percentage of variables. Pearson's chi-square test of independence was used. A p - value of less than 0.05 was considered statistically significant. Data was first entered into a Google form, then inserted into a Microsoft Excel spread sheet, coded, and transferred into SPSS. The statistical analysis was carried out using the Statistical Package for the Social Sciences (SPSS) for Windows version 16.

### *2.4 Ethical Consideration:*

Before an asking participants, an official letter was issued from the Nutrition department to the colleges administrators' to inform them about the aim of the study and to ask for cooperation to take data from students at every college. A consent form was read to all participants to be signed by students approved to enroll in the research.
The consent form includes:
1 - A briefing about the study to inform them the aim of this research.
2 - No names were used on the survey and the data were secure, collected data saved completely anonymous.
Weight and height are measured in private place.

## 3. Results:

*3.1 Background characteristics among students in University of Benghazi:*

354 students from 5 colleges shared in the study 47.5% of the students were from Medicine collage, 20.3% Dental and Oral surgery, 10.2% from Pharmacy, 12.7% from Public Health and 9.3% from Biomedical Science. The study comprised 67.5% female and 32.5% male students. 84.4% of students less than 25 years of age.

The majority of parents had university degrees 70.9% for mothers and 64.1% for fathers. most of mothers 61.1% were housewives and 68.9% of fathers employed. Additionally, 91.8% of the students were single, 87.6% had middle-class incomes. Regarding to family history disease most of participants had a family history of diabetes 42.3%. and 54.2% of the participants doing an exercise (Table 1).

**Table 1:** Demographic characteristics of students in Benghazi University (n=354):

| Qualitative Variable | | Number (%) |
|---|---|---|
| **College** | Medicine<br>Dental and Oral Surgery<br>Pharmacy<br>Public health<br>Biomedical science | 168 (47.5)<br>72 (20.3)<br>36 (10.2)<br>45 (12.7)<br>33 (9.3) |
| **Sex** | Male<br>Female | 115 (32.5)<br>239 (67.5) |
| **Age Group** | 18-24 years old<br>≥ 25 years | 299 (84.4)<br>55 (15.5) |
| **Mother's education level:** | Less than University level<br>University level<br>None | 95 (26.9)<br>251 (70.9)<br>8 (2.3) |
| **Father's education level** | Less than University level<br>University level<br>None | 113 (31.9)<br>227 (64.1)<br>14 (4) |
| **Mother's Occupation** | Housewife<br>Employee | 161(45.5)<br>193 (54.5) |
| **Father's Occupation:** | Self-employed<br>Employee | 110 (31.1)<br>244 (68.9) |
| **Marital status** | Married<br>Single<br>Others | 20 (5.6)<br>325 (91.8)<br>9 (2.5) |
| **Economic status of the family** | Low<br>Middle<br>High<br>No answer | 3 (8)<br>310 (87.6)<br>28 (7.9)<br>13 (3.7) |
| **Family history diseases** | Diabetes<br>Hypertension<br>Cardiovascular disease<br>Obesity and overweight<br>Not available | 150 (42.3)<br>104 (29.4)<br>26 (7.3)<br>12 (3.4)<br>131 (37.0) |
| **Doing exercise** | **Yes**<br>**No** | 192 (54.2)<br>162 (45.8) |

*3.2 Junk food consumption among the participant:* Table (2) demonstrate 98.9% of students consume junk food. 39.5% consume junk food once or twice a week; 51% of students eat junk food for lunch; 46.6% of students choose to eat junk food because they like the taste; 46.3% reveal that choosing a junk food option is influenced by branding; and 48.9% of students eat junk food based on their emotional state. 4% of students were vegetarians.

**Table 2** : Junk Food consumption among participant

| Junk Food consumption | Number (%) |
|---|---|
| **Number of times you consume the junk food:** | |
| 0 times ( don't eat junk food) | 4 (1.1) |
| 1-2 times a week | 140 (39.5) |
| 3-4 times a week | 43 (12.1) |
| > 4 times a week | 28 (8 ) |
| 1-2 times a month | 139 (39.3) |
| **Time of junk food consumption:** | |
| Breakfast | 17 (4.8) |
| Lunch | 180 (51) |
| Dinner | 121 (34.1) |
| Snack | 29 (8.2) |
| No specific time | 3 (0.8) |
| No junk food consumption | 4 (1.1) |
| **Reasons for choosing to eat at junk food :** | |
| Advertisement | 9 (2.5) |
| Enjoy the taste | 156 (46.6) |
| limited time | 111 (31.3) |
| Variety of menu | 42 (11.8) |
| Eat with friend / family | 58 (16.8) |
| No junk food consumption | 4 (1.1) |
| **Usual junk food meal:** Burger | 90 (25.4) |
| Fries | 98 (28) |
| Pizza | 102 (28.8) |
| Fried chicken | 60 (16.9) |
| Sandwich | 181 (51.1) |
| Soda | 48 (13.5) |
| Grilled meat | 6 (2) |
| No junk food consumption | 4 (1.1) |
| **Does branding affect the chosen junk food ?** | |
| Yes | 164 (46.3) |
| No | 86 (24.3) |
| Neutral | 104 (29.4) |
| **from Are food prices influencing the chosen junk food:** Yes | 115 (43.8) |
| No | 89 (25.1) |
| Neutral | 110 (31.1) |
| **How does nutritional information influence your choice about junk food?** Yes | 146 (41.2) |
| No | 117 (33.1) |
| Neutral | 91 (25.7) |
| **Taking junk food depends on the emotions:** Yes | 173 (48.9) |
| No | 137 (38.7) |
| Neutral | 44 (12.4) |
| **Vegetarians:** **Yes** | 14 (4) |
| **No** | 340 (96) |

**Table 3**: knowledge regarding junk food consumption among the students

| knowledge regarding junk consumption | Number (%) |
|---|---|
| **1.Junk food is:** | |
| Healthy | 13 (3.7%) |
| Unhealthy | 339 (95.8%) |
| I do not know | 2 (0.6%) |
| **2. Reasons why junk food is unhealthy** | |
| High in fat | 107 (30.2%) |
| High in energy | 65 (18.3%) |
| High sodium chloride | 12 (3.3%) |
| Low fiber | 11 (3.1%) |
| All of the above | 192 (54.2%) |
| None of the above | 7 (2.0%) |
| I do not know | 16 (4.5%) |
| **3.Consumption junk food repeatedly increase the risk of cancer:** | |
| Yes | 167 (47.2%) |
| No | 187 (52.8%) |
| **4.Eating junk food frequently increase the risk of Hypertension:** | |
| Yes | 231 (65.3%) |
| No | 123(34.7%) |
| **5.Eating junk food regularly increase the risk of Cardiovascular diseases:** | |
| Yes | 293 (82.8%) |
| No | 61 (17.2%) |
| **6.Eating junk food frequently increase the risk of High cholesterol level:** | |
| Yes | 343 (96.9%) |
| No | 11 (3.1%) |
| **7.Eating junk food frequently increase the risk of diabetes:** | |
| Yes | 236 (66.7%) |
| No | 118 (33.3%) |
| **8.Are you aware of the nutritional information and ingredients found in all of the junk food you eat?** | |
| Yes | 147 (41.5%) |
| No | 132 (37.3%) |
| I do not know | 75 (21.2%) |
| **9. food such as Burgers and Pizza contain a lot of fiber that is beneficial to the digestive system:** | |
| Yes | 35 (9.9%) |
| No | 227 (64.1%) |
| I do not know | 92 (26.0%) |
| **10.Drinks that contain carbohydrates , such as coca cola , pepsi , and fanta contain high amounts of sugar , which may cause weight gain and obesity:** | |
| Yes | 332 (93.8%) |
| No | 22 (6.2%) |

*3.3 knowledge regarding junk food consumption among the students:*

Table 3 lists ten questions about the participants' knowledge of junk food consumption (354 in total). Most respondents, 95.8%, state that junk food is unhealthy. 47.2%, 82.8%, and 82.8% demonstrate that eating junk food frequently increases the risk of cancer, hypertension, and cardiovascular disease, respectively; 96.9% and 66.7% increase the risks of cholesterol levels and

diabetes mellitus. Of those who eat junk food, 41.5% were aware of the contents; 64.1% disagree that burgers and pizza include fiber; and 93.8% concur that sugar-filled drinks including Coca-Cola, Pepsi, and Fanta are high in sugar.

*3.4 Level of knowledge among participants:*

Table 4 displays the participants' knowledge about junk food: most of them had good knowledge (47.7%), while 26.3% of participants had fair knowledge, and 26% of them had poor knowledge.

**Table 4:** The level of knowledge among participants

| Knowledge score | Frequency | Percent |
|---|---|---|
| **good knowledge ( 80-100%)** | 169 | 47.7 |
| **Fair knowledge ( 60-79%)** | 93 | 26.3 |
| **Poor knowledge (less than 60%)** | 92 | 26.0 |
| **Total** | 354 | 100.0 |

*3.5 BMI classification among participants:*

According to the participants' body mass index, the majority of students (52.8%) had a normal BMI. While 26.3% of participants were overweight, 13.6% were obese, and only 7.3% were underweight. as shown in figure 1.

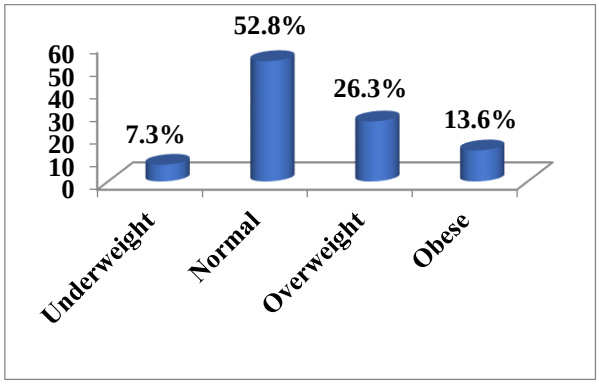


**Figure 1:** BMI classification among students

*3.6 Association between junk food consumption and BMI among participants:*

Table 5 shows that most 26.3% of participants were overweight. 7.5% of them eat junk food more than 4 times a week. 13.6% of students were obese. 6.2% of them eat junk food more than 4 times a week. There's no association between BMI level and fast food consumption with a p-value greater than 0.05.

## 4. Discussion:

…This study was conducted to determine the association between junk food consumption and obesity at the University of Benghazi. Among 354 students from five medical colleges in the University of Benghazi. The majority of data was provided by females, 67.5%. The majority (84.4%) were less than 25 years old. Furthermore, 87.6% of the students were middle-class income, and 91.8% of them were single. In terms of family medical history, 42.3% of participants had a family history of diabetes.

*4.1 Junk food consumption:*

Among 354 students in this study, most of them (98.9%) consume junk food. 39.5% of students in this study consume fast food 1-2 times per week, which is lower than the 74.5% of students who consume fast food 1-2 times per week in another study [20]. Most of the participants in the other study had fast food during lunchtime (43.7%), which is comparable to the 51% of participants in this study [21]. The primary reason students visit fast food restaurants is because they enjoy the taste, but in a different survey conducted by Al Otaibi et al., the percentage of students who enjoyed the taste was the lowest at 25.3% [22].

In this study, 48.9% of students reported that their consumption of fast food was significantly influenced by emotions like happiness, sadness, anger, and worry. In contrast, a study on medical students in India found that 55% of students approved of this statement and 23.3% were upset [23]. Exercise is important for maintaining health, reducing the risk of chronic illnesses, preventing rapid weight gain, and improving physical fitness [24]. In the current study, 54.2% of students reported exercising. While 76.7%

**Table 5:** Junk food consumption and BMI among participants:

| Number of times you consume the junk food: | BMI descriptive Number (%) | | | | Total | p- value |
|---|---|---|---|---|---|---|
| | Under-weight | Normal | Over-weight | Obese | | |
| 0 times | 0 (0 ) | 3 (1.6) | 0 (0) | 1(2.1) | 4(1.1) | 0.3* |
| 1-2 times a month | 14(53.8) | 63(33.7) | 44(47.3) | 18(37.5) | 139 (39.3) | |
| 1-2 times a week | 8 (30.8) | 81(43.3) | 33(35.5) | 18(37.5) | 140 (39.5) | |
| 3-4 times a week | 3(11.5) | 23(12.3) | 9(9.7) | 8(16.7) | 43 (12.1) | |
| >4 times a week | 1(3.8) | 17(9.1) | 7(7.5) | 3(6.2) | 28(8) | |
| Total | 26(7.3) | 187(52.8) | 93 (26.3) | 48 (13.6) | 354 (100.0) | |

*p-value is not significance

of the sample in a different study did not play sports. [25]. 49.5% of medical students in Southern Thailand participated in physical exercise. [26] These findings emphasize that while junk food consumption is widespread, the factors influencing this behavior, such as taste, emotional states, and lifestyle practices, vary significantly. Recognizing these influences is essential in developing targeted interventions to address unhealthy eating patterns and promote healthier choices among university students.

*4.2 knowledge regarding Junk food consumption among the participants:*

In the study, 95.8% of participants acknowledged that fast food is unhealthy. This contrasts with findings from another study, which included undergraduates from medicine, engineering, and architecture programs. In that study, a significant portion of students knew that eating fast food had no negative health effects, with 40% of medical students, 26% of engineering students, and 57% of architecture students holding this view. [27] However, this study demonstrates that 18.3% of medical students recognize that consuming fast food increases the risk of high energy levels. Similar to Sudhanshu et al., they noted that fast food is high in calories. [27].

While only 19.6% of students in a different study read the nutritional information about fast food, 41.5% of participants in this study were aware of the ingredients and nutritional information about the fast food they eat. [22].

Among the participants of this study, 66.7 of them believe that eating fast food frequently raises the risk of developing diabetes. A study found that regions with a high concentration of junk food and few other dining options may be particularly harmful to the development of diabetes [28].

Knowledge of junk food's negative effects doesn't always translate into changed behavior. Sims et al. found only 25% of participants had good knowledge and 52% had poor knowledge [29], contrasting with another study reporting 47% good knowledge. Despite this awareness, fast food consumption remains high,

emphasizing the importance of practical application. This is supported by research on medical students' knowledge application [30]. While medical students are often aware of the health consequences associated with junk food, as supported by Habib et al., this awareness doesn't always lead to healthier dietary habits [31] The lack of correlation between knowledge and reduced consumption, found in this study as well, suggests that awareness alone may not be sufficient to curb junk food intake. Instead, integrating practical applications of this knowledge into students' lifestyles could be more effective, especially as many students continue to favor convenience and taste over nutritional value despite understanding the health risks.

*4.3 Classification of BMI :*

In this study, the participants' BMI levels were 7.3% underweight, 52.8% normal weight, 39.9% overweight, and obesity. In comparison, similar BMI values were discovered in another study by Shah et al., with 59.18% normal, 31.9% overweight, and obesity [32].Another study conducted in Syria discovered that the percentage of BMI among medical students was 82.5% obesity and overweight [25]. These studies illustrate a broader public health concern, as university environments seem to facilitate factors that contribute to increased BMI, potentially impacting young adults' long-term health.

*4.4 Junk food consumption and BMI classification:*

Various studies have demonstrated a positive correlation between the consumption of junk food and elevated BMI levels among students [33; 35]. A study demonstrated that there was a significant relationship between BMI and fast food consumption [32].

No significant association ($p > 0.05$) was found between BMI and junk food consumption, aligning with previous research [36; 20]. This lack of association highlights the likely influence of other factors—genetics, physical activity, and overall diet—on BMI. The results underscore the complex interplay between diet and weight, suggesting that while junk food may contribute to weight gain generally, individual factors can significantly modify this relationship.

## 5. Conclusions:

This study revealed a high prevalence of overweight and obesity among Benghazi University students, despite a significant students exhibiting normal BMI. While increased weekly junk food consumption was observed, no significant association was found between this consumption and BMI. This suggests that factors beyond junk food consumption, such as emotional eating and taste preferences, may significantly influence weight status in this population, despite students' awareness of the health risks associated with junk food.

## Study limitations:

Limitations include convenience sampling, potentially biasing participant selection, and a short data collection period. Self-reported data may also introduce response bias, affecting the study's results.

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## Conflict of Interest

No conflict of interest was declared by the authors.

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