

## **Eating Habits and Obesity among Lebanese University Students**

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### ***Abstract***

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**Background:** Lebanon has been experiencing a nutritional transition in food choices during the past years from the typical Mediterranean diet into the fast food pattern. Dietary habits of young adults are affected by such transition and, as a consequence, overweight and obesity are increasingly being observed among the young. The purpose of this study was to assess the prevalence of overweight and obesity in a sample of students from the Lebanese American University and examine their eating habits.

### **Methods:**

A cross-sectional survey of 220 students (43.6% male and 56.4% female), aged  $20 \pm 1.9$  years, were recruited randomly from the Lebanese American University (LAU) campus during the fall 2006 semester. Students were asked to fill out a self-reported questionnaire that included questions on their eating, drinking and smoking habits. Weight, height, percentage body fat and body mass index were measured. Body mass index (BMI) was used to assess students' weight status. Statistical analyses were performed using the Statistical Package for Social Sciences software (version 13.0) to determine overweight and obesity among students and to categorize eating habits.

### **Results:**

The outcomes of this study indicate that the majority of the students (64.7%) were of normal weight (49% of male students compared to 76.8% of the female students). Prevalence of overweight and obesity was more common among male students compared to females (37.5% and 12.5 % vs. 13.6% and 3.2%, respectively). In contrast, 6.4% of female students were underweight as compared to 1% of males. Eating habits of the students showed that the majority of students (61.4%) reported taking meals regularly. Female students showed healthier eating habits compared to male students in terms of daily breakfast intake and meal frequency. 53.3 % of female students reported eating breakfast daily or three to four times per week compared to 52.1% of male students. There was a significant gender difference in the frequency of meal intake ( $P= 0.001$ ). Intake of colored vegetables and fruits was common among students. A total of 30.5% of students reported daily intake of colored vegetables with no gender differences (31.5 % for females vs. 29.2% for males). Alcohol intake and smoking were not common among students.

**Conclusion:** Although, the overall prevalence rate of overweight and obesity in the studied sample was low, results indicate that university students would benefit from a nutrition and health promotion program to reduce the tendency of overweight and obesity among male students and to improve their eating habits.

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**Background:** Lebanon has been experiencing a nutritional transition in food choices during the past years from the typical Mediterranean diet into the fast food pattern (1). Dietary habits of young adults are affected by the fast-food market. As a consequence, overweight and obesity are increasingly observed among the young. Obesity in combination with unhealthy life style, such as smoking and physical inactivity, may increase the risk of chronic diseases. In this regard, nutritional knowledge may act as a deterrent against fast-food trend and universities may contribute significantly in reducing the prevalence of obesity in the young population through the promotion of healthy eating habits. Universities may provide an ideal forum for reaching a large number of young adults with nutrition education programs that may positively influence students' eating habits by advocating for the adoption of healthy food choices. The purpose of this study was to assess the prevalence of overweight and obesity in a sample of students from the Lebanese American University and examine their eating habits. Assessing students' weight status and eating habits will help health educators in developing the proper nutrition-related education programs to promote healthy food choices and good eating habits among students.

## **Methods**

### **Design and sample**

The study design was a cross-sectional survey conducted at the Lebanese American University (LAU) campus during the fall 2006 semester. A sample of 220 students (43.6% male and 56.4% female), aged  $20 \pm 1.9$  years participated in this study. Students were recruited randomly from the Lebanese American University (LAU) campus by a trained student accompanied by an LAU professor. The response rate among students was high and students who agreed to participate in this study were asked to sign a consent form according to Helsinki declaration.

### **Data Collection**

Data collection occurred in two steps. The first step was to fill out the questionnaire and the second step was to perform the anthropometric measurements. Recruited students were asked to fill out a questionnaire related to their eating, drinking and smoking habits. The questionnaire was adopted from a previously published study where authors have standardized its use among university students (2). Prior to questionnaire administration, students were informed by an LAU professor about the study and they were provided with instructions on how to fill out the questionnaire and how to answer all questions completely and truthfully. After filling out the questionnaire, anthropometric measurements, such as weight and height, percentage body fat and body mass index, were taken for students. Weight, percentage body fat and body mass index measurements were determined using Tanita scale body fat analyzer 300A (BF 300, courtesy of Abbott Diagnostic Company, Lebanon). As fluctuations in body hydration status may affect body composition results, conditions for Tanita scale measurements were taken in the morning ( at least three hours after waking up) when students were on an empty bladder, not having exercise, food or drink for at least three hours before having the

measurements. Students were asked to wipe off the bottom of their feet before stepping onto the measuring platform, since unclean foot pads may interfere with conductivity, and were asked not to perform physical activity or have food or drink for the at least three hours before testing. Height measurements were taken with a secured metal ruler. Students were asked to take off their shoes for height measurements. Body mass index (BMI) was used to assess students' weight status. According to guidelines stated by the National Institutes of Health, weight status was classified into four categories: underweight (BMI  $\leq 18.5$ ), normal weight (BMI between 18.5 – 24.9), overweight (BMI between 25- 29.9), and obese (BMI  $\geq 30$ ) (3). Normal range for percentage body fat was considered as follow: 10-20% for males and 20-30% for females.

### **Data Analysis**

Statistical analyses were performed using the Statistical Package for Social Sciences (version 13.0, SPSS, Inc) software. Analysis of variance (ANOVA) was used to examine for differences in the anthropometric characteristics of students. Results were expressed as means  $\pm$  SD (standard deviation). Parametric variables were analyzed using student's *t*-test, while chi-squared analyses were conducted for non-parametric variables. All reported *P* values were made on the basis of 2-sided tests and compared with a significance level of 5%; differences were considered statistically significant at  $P < 0.05$ .

### **Results**

#### **Characteristics of the students' sample and BMI values**

Characteristics of the participated students are presented in Table 1. A total of 220 students (96 males and 124 females), with a mean age of  $20 \pm 1.9$  years, participated in this study. The average weight and height of the participated students were  $67.7 \pm 15.8$  kg and  $168.0 \pm 10.0$  cm, respectively. Mean BMI and percentage body fat were  $23.6 \pm 4.1$  and  $23.7 \pm 8.2$ , respectively.

#### **Students' weight status based on BMI categories and percentage body fat**

The outcomes of this study indicate that the majority of the students (64.7%) were of normal weight (49% of the male students compared to 76.8% of the female students) as indicated in Table 2. Based on BMI classification, the prevalence of overweight and obesity was more common among male students compared to females (37.5% and 12.5 % vs. 13.6% and 3.2%, respectively). In contrast, 6.4% of female students were underweight as compared to 1.0% of males. Students of normal weight had at the same time normal percentage of body fat (14.4 for males vs. 26.7 for females). Similarly, the obese male students had at the same time higher values of percentage body fat (24.4%) while the overweight male students had a percentage body fat that was slightly higher than the normal range (20.1%) (Table 3). In the underweight category, female students also had a lower percentage of body fat (16.7%) (Table 3).

#### **Students' Eating habit**

Eating habits of the students were compared by gender (Table 4). The majority of

students (61.4%) reported taking meals regularly. Female students showed healthier eating habits compared to male students in terms of breakfast intake and meal frequency. 53.3% of female students reported eating breakfast daily or three to four times per week compared to 52.1% of male students. There was a significant gender difference in the frequency of meal intake ( $P= 0.001$ ). The majority of students (52.7%) reported eating two meals per day. Among females, 56.5% reported eating two meals per day as compared to 47.9% of males. Intake of colored vegetables and fruits was common among students. A total of 30.5% of students reported daily intake of colored vegetables with no gender differences (31.5 % for females vs. 29.2% for males). 27.3% of students reported daily intake of fruits. Male students tend to eat more fruits daily as compared to females (29.2% vs. 25.8% respectively). Alcohol intake was not common among students. 25.3% of the studied students did not consume alcohol at all and the majority (57%) of students reported drinking alcohol rarely whereas 17.2% reported two/three times per week drinking alcohol. The unhealthy eating practice was indicated by the fact that the majority (57.3%) of students reported eating fried food more than three times per week. Among females, 54% reported eating fried food three or four times per week as compared to 61.4% among males. Daily intake of snacks apart from regular meals was more common among females than males (55.6% vs. 50% respectively). Eating daily with friends and family was common among students (42.7%) with no differences in gender. Smoking was not common among students. 62.4% of the students reported that they never smoke, 7.2% were ex-smoker and 30.3% were current smoker.

**Table 4.** Student's Response to Questions Related to their Lifestyle Practices including Eating Habits, Meal Patterns, Fruits and Vegetables Intake, Fried Food, Alcohol Consumptions and Smoking Habit.

### ***Discussion***

The purpose of this study was to assess the prevalence of overweight and obesity and examine eating habits in a sample of Lebanese University students. Body mass index was used to assess weight status. Based on BMI classification of weight status, findings of this study indicate that the majority of students were of normal weight. Normal weight was more prevalent among females (75.8%) as compared to males (47.9%), whereas, overweight and obesity were more common among male than female students. students in the normal weight category had at the same time normal values of percentage body fat. Prevalence of overweight was 37.5% in males as compared to 13.7% in females. Obesity was more common among male students than among females in the studied population. A total of 12.5% of males were obese compared to 3.2% of females and obese students had at the same time higher values of percentage body fat. The lower rate of obesity among female students is expected since females are more cautious about their weight status than males, due to society perceptions which encourage females to be slender. This assumption was supported by the fact that only 2.1% of males were underweight as compared to 7.3% of females in this studied sample. Obviously, pictures of movie stars and models in fashion magazines and mass media have a strong impact on girls' body shape and image perception (4). University girls see the shape and weight of fashion models as the ideal body shape and figure to attain. Girls with such strong body weight perception can be at risk of developing eating disorder (5). Similar findings of

prevalence of obesity among male university students were reported in recent studies (6, 7). In a study conducted among 749 students (68% females and 32% males) recruited from the State University of the Basque Country, prevalence rate of overweight and obesity was 25% in males compared to 13.9% in females (6). Another study conducted among 989 medical students (527 men, 462 women) from the University of Crete reported that approximately 40% of male students and 23% of female students had BMI > 25 kg/m<sup>2</sup> (7). High prevalence rate of overweight and obesity was also reported in a study conducted in Kuwait University among 842 students (8), at 32% and 8.9%, respectively. In United Arab Emirates, a cross-sectional survey conducted among 300 male students reported that the prevalence rate of obesity was 35.7% in males and this figure was higher than the rate in females (9). In terms of eating habits, university students usually do not follow healthy eating habits. The typical university student diet is high in fat and low in fruits and vegetables (10). Students often select fast food due to its palatability, availability and convenience. A previous survey by the American Dietetic Association indicated that obesity, or being severely overweight, is a fast-food related issue (11). The Healthy people 2010 objectives include a focus on nutrition and obesity prevention (12). In this study, data analyses of students' eating habits revealed that the majority of students eat meals regularly and eat breakfast daily or three to four times per week. 52.7% of students eat meals two times per day. However, there was a significant gender difference in the frequency of meal intake in the studied sample ( $P= 0.001$ ). As expected, intake of colored vegetables and fruits was also common among students. Alcohol intake and smoking were not common among students. The majority of students believe that eating meat, vegetables and other foods will provide them with a balanced diet. 77% of male students and 73% of female students in this study agreed that it is important to eat a variety of foods to have a balanced and nutritious diet. A study conducted at Midwestern University among 105 male and 181 female students, reported that 94.4% of the students agreed that it is important to eat a variety of foods for good health (13). In another study, healthful diet was classified as a diet that included more fruits and vegetables, and less fat (14). Daily intake of snacks was reported by the majority of the students. The unhealthy eating habit of students was noticed in the intake of fried food; majority of the students reported eating fried food three or four times per week. Frequent snacking and eating fried food can adversely affect students' health status, given the abundance of energy dense and high fat ingredients they contain. Improving students' knowledge about nutrition and healthy eating habits may promote healthy body weight management among students and reduce the prevalence of overweight and obesity. A recent study (15) conducted among college students reported that increased knowledge of dietary guidance, *Dietary Guidelines for Americans 2005*, appeared to be positively related to more healthy eating patterns among college students thus the better eaters had a higher level of knowledge about nutrition(15). Therefore, developing nutrition education programs that emphasize healthy eating habits for university students should be encouraged. Alcohol intake and smoking were not common in our sample of students. National data on alcohol intake and the prevalence of smoking among university students in Lebanon are limited. A previous study conducted among 1850 Lebanese university students reported that the prevalence of drinking alcohol was found to have increased through the 1990s. However, the author stated that protective factors, such as belief in God (irrespective of the students' religion), practice of faith, and

family or peer negative attitudes towards excessive drinking, were associated with less frequent experimentation with alcohol (16). A previous study conducted among 2443 students from 13 public and private schools in Greater Beirut reported that the prevalence rate of cigarette smoking was 2.5% (17). In a recent study, namely the Lebanon Global Youth Tobacco Survey (GYTS), conducted among 5035 students aged 13-15 years from 50 schools reported that the prevalence rate of students who were current cigarette smokers was 8.6% and 33.9% were current water-pipe smokers. The GYTS indicated that half of students who were current smokers expressed their desire to stop smoking (18).

### **Limitations**

The findings of this study are limited by the use of a sample of students from just one university which may not be representative of all university students in Lebanon. Furthermore, students attending the Lebanese American University are usually of high socio-economic standards. Therefore, samples from different universities may provide a more inclusive picture of university students taking into consideration religion and socio-economic status. However, baseline information about weight status and eating habits among a sample of university students was certainly provided by the present study.

**Conclusion:** Despite the low prevalence rate of overweight and obesity in the studied university students' sample, results indicate that university students would benefit from a nutrition and health promotion program to reduce the tendency of overweight and obesity among students, and particularly males, to increase awareness of healthy weight management, and to improve students eating habits.

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**Additional files provided with this submission:**

Additional file 1: paper-najat-obesity-03-08[1]-new-1-8-08-tables only.doc, 130K

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