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Fast Food Consumption Associated with Obesity/Overweight Risk among University Female Student in Saudi Arabia

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Abstract: The aims of this study was to examine the pattern of fast food consumption among university students and to determine the association between fast food consumption and body weight status. A total 276 volunteer female students aged 18 to 25 years old and usually ate fast food from different college in King Faisal University, constituted the sample of the study. The prevalence of obesity/overweight was 29.7%. A total 130 (47.1%) students reported eating fast food two or more time per week and the main reasons for the consumption were lack of cooking skills. Eighty percent of the students never read the nutritional information at the fast food restaurant and only 5% of the students order healthier items always or most of the time. A significant correlation between BMI and frequency of consumption ($r = 0.125$; $p = 0.05$) was observed and the Logistic Regression model found obesity/overweight to be significantly associated with frequency of fast food consumption for students going two or more times per week (OR 3.072; 95% CI 1.107-8.523). Increase awareness about healthy choices of fast food by health education programs are recommended to promote healthy lifestyles and dietary habits among university students.

Key words: Fast food, university students, obesity/overweight, consumption habits

INTRODUCTION

Obesity and overweight among female are becoming an increasingly important public health issue in Saudi Arabia, which are resulting in lifestyle transition between traditional and sedentary to become more westernized, recent studies reported prevalence of obesity and overweight among female between 29 to 33.5% (Memish *et al*., 2014; Darwish *et al*., 2014). This has been an alarming increase in the prevalence of chronic diseases such as hypertension, cancer, diabetes and heart diseases. Treatment of chronic diseases is costly and may even be ineffective. The annual cost for treatment of diabetes in Saudi Arabia was estimated to be seven billions Saudi Riyal in the year 2007 (MOH, 2007).

University students are more likely to miss meals or eat away from home with friends than they were in childhood or adolescence years. There is evidence that dietary quality declines during college years as intake of fruits, vegetables and milk, whereas intake of fast food and soft drinks increase during this time (Alfawaz, 2012; Fraser *et al*., 2011). The consumption of food away from home, including that of fast food, has increased in Saudi Arabia, among adolescent and youth from twice a month in 2007 (Farghaly *et al*., 2007) to more than twice a week (AL-Hazzaa *et al*., 2012).

Fast food is defined as food can be prepared and served in very quickly (Habib *et al*., 2011). Fast food has a negative effect on diet quality, body weight and overall health (Kant and Graubard, 2004; Schroder *et al*., 2007). Some of these factors include large portion sizes, high energy density from fat and saturated fat approximately 65% more than the energy from home prepared meals (Cummins and Macintyre, 2006). Also fast foods are high in sodium and low fiber (Kim and Park, 2005), which that increase the risk for overweight and obesity (Barnard, 2010; Currie *et al*., 2009). The factors which influence fast food consumption are convenient, costs, menu choices (Driskell *et al*., 2006), flavor and taste (Brynat and Dundes, 2008). Hence, the present study aims to examine the pattern of fast food consumption among female university students and to determine the association between fast food consumption and body weight status.

MATERIALS AND METHODS

This cross sectional study was carried out from October to December 2014 on the campus of the King Faisal University (KFU) among 276 volunteer female students aged 18 to 25 years old and usually ate fast food. The exclusion criteria of this study were the subjects who were pregnant and suffering from chronic diseases. All of the students were made well informed of the study aims and verbal consent was taken for their participation in the study. Sample size based on Wang (2012), the required sample for this study was 226 students, where n is the minimum sample size, z = standard deviation score = 1.96, p = prevalence of weekly fast food intake

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82% among university students (Ibrahim *et al*., 2014), q = 1-p, d = 0.05 at the 95% confidence interval. n = z^2pq/d^2, n = $(1.96)^2$ x (0.82) x (1-0.82)/$(0.05)^2$ = 226 students

After taking the necessary approvals from college of Agriculture and Food Science the research data were collected using the technique of interviewing by questionnaire forms were conducted in the classroom and university canteen, the questionnaire form consisted of three sections.

Instruments

Socioeconomic information: Age, marital statuses, household income, living status, are classified as socioeconomic information.

Anthropometric measurements: Height was measured to the nearest 1 cm by meter in condition of standing position near to the wall, paired feet, without shoes and four contacted points of the body (shoulder, hip, heel and head) to wall. Body weight was measured to the nearest 0.1 kg by standard scale in light indoor clothes, with emptied pockets and without shoes. Weight and height each were measured three times and the average of each was taken to be used in the Body Mass Index (BMI) calculation classified according to World Health Organization guidelines (WHO, 1998).

Dietary information: Fast food consumption and behavior as consumption per week cause behind fast food consumption, time preferred for fast food consumption etc (Table 2).

Data analysis: Descriptive statistics including mean, standard deviation, frequencies, were calculated. The correlation between the frequency of fast food consumption and BMI was determined by Pearson correlation analysis. Logistic Regression model was performed to assess the relationship between the frequencies of fast food consumption by BMI category of obesity/overweight in order to explore how the independent variable (fast food consumption two or more times per week) can predict and influence the dependent variable (obesity/overweight). SPSS version 19.0 was used for statistical analyses.

RESULTS

The study subject was composed 276 volunteer female students with mean age 21.94±1.01. Table 1 showed the socioeconomic information and anthropometric measurements, regarding to the family income majority of the students (38.4%) had an income between 5,000-10,000 SR and 61.6% were not married. The prevalence of obesity/overweight was 29.7% and only 13.1% were underweight and the rest were in the normal category, 45.2% of students living in the university hostel. A total

Table 1: Socioeconomic information and anthropometric measurements (n = 276)

---------- Socioeconomic information ----------		
Age	21.94±1.01	
	N	(%)
18-20	16	5.8
21-23	238	86.2
24-25	22	8
Income (SR)		
<3000	14	5
3001-5000	60	21.7
5001-10,000	106	38.4
>10,000	96	34.8
Marital status		
Married	106	38.4
Single	170	61.6
Living status		
With family	151	54.8
University hostel	125	45.2
Anthropometric measurements		
Weight (kg)	58.86±12.19	
Height (m)	1.58±0.05	
Body mass index (BMI) (kg/m^2)	23.49±4.36	
Indicators		
Underweight	36	13.1
Normal weight	158	57.2
Obesity/overweight	82	29.7

130 (47.1%) students reported eating fast food two or more per week, the main reasons for the consumption were lack of cooking skills (40.6%), easy to access (34.1%) and taste (25.3%). Sixty seven percent of students going with family to eat fast food, the most frequently meal eaten from a fast food restaurant was dinner (78.3%) and only 26.1% order the small meal (Table 2).

Most of the students (58.7%) preferred home as a place to eat fast food and 44.2% spend 21-30 Saudi Real daily to buy fast food, the main factor of fast food restaurants preference was cleanliness and hygiene (53.6%), then food quality (20.3%) and the lowest percentage was to lower prices with only 1.4%. Only 19.6% of the students read the nutritional information at fast food restaurants and the majority of them sometimes (58.7%) order healthier items (Table 2). The prevalence of overweight and obesity increased consistently with frequenting fast food restaurants, from 43.9% of those going once a week to 56.1% of those going two or more times per week (Table 3). Pearson correlation analysis indicated a significant correlation between BMI and frequency of consumption (r = 0.125; p = 0.05). The Logistic Regression model found obesity/overweight to be significantly associated with frequency of fast food consumption; students going two or more times per week were thrice more likely to be obese/overweight (OR 3.072; 95% CI 1.107-8.523).

DISCUSSION

Obesity and overweight are a risk factor for many diseases (WHO, 2000). In Saudi Arabia, as well as in

Table 2: Fast food consumption and behavior (n = 276)

	N	(%)
Fast food consumption (day/week)		
One day/week	146	52.9
Two or more/week	130	47.1
Factors influencing consumption		
Taste	70	25.3
Easy to access	94	34.1
Lack of cooking skills	112	40.6
Going to fast food restaurants		
Friends	68	24.6
Family	186	67.4
Alone	22	8
Meal most frequently eaten from a fast food restaurants		
Breakfast	14	5.1
Lunch	46	16.7
Dinner	216	78.3
Meal size		
small	27	26.1
Medium	184	66.7
Large	20	7.2
Meal order		
Meal package	172	62.3
Individual items	104	37.7
Average amount of money spent on fast food daily (SR)		
<20	112	40.6
21-30	122	44.2
31-40	28	10.1
>40	14	5.1
Place of consumption		
Restaurants	92	33.3
University	22	8
Home	162	58.7
Factors influencing fast food restaurants preference		
Cleanliness and hygiene	184	53.6
Lower price	4	1.4
Fast delivery	22	8
Fast service	16	5.8
Food quality	56	20.3
Products diversity	30	10.9
Read nutritional information at fast food restaurants		
Yeas	54	19.6
No	222	80.4
Order healthier food items at fast food restaurants		
Always	14	5.1
Usually	34	12.3
Sometimes	162	58.7
Never	66	23.9

Table 3: Distribution of obesity/overweight subjects by fast food consumption frequency

	Fast food consumption (day/week) (n%)	
Total obesity/ overweight	One day/week	Two or more/week
82	36 (43.9)	46 (56.1)

other countries the prevalence of obesity and overweight has increased, especially among female (Memish *et al*., 2014; Darwish *et al*., 2014) to resolve this issue focusing on eating behaviors such as fast food consumption is important. In the present study the prevalence of obesity/overweight was 29.7%, a similar prevalence was reported among female from Dammam University, King Abdul-Aziz University in Jeddah, KSA (29.1 and 26.8%; respectively) (Koura *et al*., 2012; Ibrahim *et al*., 2014) and also according to a study conducted by Khalaf *et al*. (2015) in southwestern Saudi Arabia, the prevalence of obesity/overweight among university female students was 23.8%.

These findings were consistent with the results of similar studies in other Middle East countries. In the United Arab Emirates obesity/overweight accounted for about 35% of the female university students (Musaiger *et al*., 2003) also in Oman 28.2% (Kilani *et al*., 2012), but in Lebanon, the prevalence of obesity/overweight among university students was 16.8% (Yahia *et al*., 2008) which are lower than the prevalence reported in the percent study. The percentage of those who consume fast food more than twice a week (47.1%) was lower than the 66.5% reported by Aboul Azm and Elebiary (2010) among female nursing students in Saudi Arabia and similar to (41.3%) Khalaf *et al*. (2015) study but the female students in King Saud University (Alfawaz, 2012) reported lower prevalence (25.5%) comparable to our study. In other countries like United States only 19.2% of female university students ate fast food two or more times per week (Stockton and Baker, 2013). Meanwhile, the frequent fast food consumption is associated with greater weight gain, higher daily energy intake comes from high intake of saturated fatty acid, trans fatty acid and poor diet quality (Larson *et al*., 2011).

The main reason that students go to fast food restaurants is that they are having lack of cooking skills, while 45.2% of them were living in the university hostel traditionally with Saudi families', mothers have been responsible for planning and preparing meals and that can explain why students had lack of cooking skills. Dave *et al*. (2009) have reported similar results and found that lack of cooking skills and dislike of cooking significantly related to the frequency of fast food consumption. Taste was the main reason for university students in India (Kumar *et al*., 2013) and United States (Anderson *et al*., 2011) (64 and 76.7%; respectively), but in our study the percentage of taste was the lowest (25.3%), these findings were consistent with Yardimci *et al*. (2012) who reported that taste had the lowest percentage also (23.9%) among Turkish female university students.

Eating with friends and family were the most prevalent reasons, among a sample of college students from a large Midwestern university (Morse and Driskell, 2009). Driskell *et al*. (2006) indicated that first reasons for choosing to eat fast food were to eat with friends and family. This study also indicated that the female students choose to eat with family (76.4%) and friends (24.6%). Two third of the students eat fast food at home, this high rate of fast food consumption at home could be due to the convenience of ordering and delivery of fast food at home compared to either at university or going to restaurants. Alfawaz (2012) has reported almost similar results among university female students (54%).

The first three factors classified by the participating students as "absolutely important" in their restaurant preferences are cleanliness and hygiene (53.6%), food quality (20.3%) and product diversity (10.9%), which is similar to Yardimci *et al.* (2012) where the first three factors among female university students were taste, cleanliness and hygiene and product quality. The lowest factor can influence fast food restaurant preferences was a low price and that may be due to the relatively low price of fast food also almost 75% of students had family income more than 5,000 SR which is mainly due to the high per capita income of Saudi.

Dinner was the most frequently eaten from a fast food restaurant among student (78.3%), that may be due to the fact that students are on campus and less likely to leave classes for lunch or may not eat three meals a day or may be for another reason not addressed by this study. Stockton and Baker (2013) reported similar results among university students from the United States, that dinner was the most frequently eaten from of fast food restaurant (43.7%). The present study indicated that 66.7% of students select medium portion sizes. This may be because they have been trying to lose weight, especially during the college years (Lowry *et al.*, 2000). Eighty percent of the students never read the nutritional information at the fast food restaurant and only 5% of the students are ordering healthier items always or most of the time, Anderson *et al.* (2011) reported only 16% of the respondents who went to fast food restaurants used nutritional information when ordering. Opposite result found in a Swedish study, it was reported that female students led a healthier lifestyle than male students (Von Bothmer and Fridlund, 2005).

The link between frequent intake of fast food and the occurrence of obesity has been reported (Fraser *et al.*, 2010). The present study reported positive significant correlation ($p = 0.05$) between frequency of consumption and BMI level. Moreover, 56% of the students who eat fast food two or more time weekly are obese/overweight, which is putting these students at risk for many chronic diseases related to high fat intake. Similarly, a cross sectional study of adults showed that, prevalence of obesity increased with frequented visit to fast food restaurants from 24% of those going less than once a week to 33% of those going two or more times per week (Anderson *et al.*, 2011). Students going two or more times per week were thrice more likely to be obese/overweight, similar result was reported among Bangladeshi university students, students who were going two or more times per week were twice more likely to be obese (OR 2.2; 95% CI 1.3-3.9) (Shatabdi *et al.*, 2014). Also study among European students showed that, fast food consumption was a risk factor for obesity (odds ratio: 2.27; 95% CI 1.08 to 4.77) (Fraser *et al.*, 2011).

Limitations of the study:

1. It is as cross sectional study, which does not infer causal relationships.
2. The sample was selected from female students of KFU and the students from the other universities outside Al-Hassa city are not included in the sample.
3. Participants are limited to only female university students.
4. We assessed only the frequency of eating fast food without accounting for the portions size, this can give more information about the fast food consumption.

Conclusion: A percent study showed that there is significant correlation between consuming fast foods, frequency and BMI, also we found significant association between frequency of fast food consumption (two or more times per week) and obesity/overweight. It can be recommended that awareness should increase among students about healthy choices of fast food, complications of obesity/overweight. Health education programs are recommended to promote healthy lifestyles and dietary habits among university students.

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