

Frequency of Fast Food Consumption: Effects on the Nutritional Status of Groups Aged 12-22 Years

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ABSTRACT

Fast food consumption has increased greatly particularly among youth. The attraction of eating fast food items makes the youth gain weight and badly affects their health. To study the effect of frequency fast food consumption, 868 subjects (males and females) aged 12-22 years were selected randomly from clubs and youth centers in Alexandria city. Socio-demographic characteristics, frequency and attitude toward fast food consumed, weight, height and body mass index (BMI) were recorded. Dietary intake was estimated using 24 hours recall for 3 consecutive days. It was found that consumption of fast food was prevalent between both genders. Frequency of consumption of fast food showed that 38.7% of subjects eat fast food frequently (group1) and 61.3% of them eat fast food less frequently (group2). Proportion of subjects with BMI greater than 85th percentile was significantly higher among group1 (36.9%) than group 2 (28.9%) indicating a risk of overweight and obesity of subjects, who eat fast food frequently compared with those who eat fast food less frequently, consumed higher intake of energy, protein, fat and carbohydrate. Mean energy intake of males and females in group1 and group2 covered (85.3%, 78.1%) and (92.3%, 84.1%), respectively of RDA, while protein intake exceeded the recommendation for both groups. Television advertisements have a significant influence on fast food consumption. Only 22% of group1 and 31.2% of group2 believed that fast food can cause disease cases, while 41.7% of group1 and 43.2% of group2 believed that consumption of fast food is harmless. Animal protein was consumed in high proportion of subjects eat fast food frequently, while consumption of plant protein was high among those eat fast food less frequently. Public health measures should be aimed at limiting the amount and frequency of fast food consumption. This could include nutritional education campaigns, regulation of fast food advertising, getting rid of fast food restaurants in schools, and increasing healthy food vendings in youth centers, clubs, schools, and education foundations.

Keywords: *adolescents, fast food, energy intake, obesity, nutritional status.*

INTRODUCTION

Eating outdoor is an ancient practice. In Egypt around 512 B.C. a restaurant offered a single dish of wild *foul*, cereals and onions. Of course, restaurants have changed since 2500 years ago. Today, there are over 500,000 fast food restaurants worldwide, which are fast, fun, inexpensive and can be found almost everywhere, even in some schools (FAQ, 2006).

Fast food is a food, which is prepared and served quickly at outlets called fast-food restaurants. Fast-food outlets are take-away or take-out providers, in which customers can eat the food inside the premises. Fast foods include fish and chips, sandwiches, hamburgers, fried chicken, French fries, chicken nuggets and pizza (Wikipedia, 2006).

Fast food pervades virtually all segments of society including local communities, public schools and hospitals (Zive *et al.*, 2002). This trend seems to have been driven by massive advertising and marketing campaigns aimed at children and their parents (Nestle, 2002).

The number of teenagers eating more fast food is increasing since the 1970s. Since this overeating and obesity have also been on the rise. This is due to huge portion sizes, high calorie content, refined flour, added sugar, high fat content and low levels of dietary fiber (Ebbeling *et al.*, 2004). Unsafe dieting practices among youth not only cause nutritional deficiencies, but also physical and psychological problems. Previous studies demonstrate that consumption of fast food is directly related to total energy intake and adversely related to diet quality (French *et al.*, 2001, Shanthy *et al.*, 2004). Some other studies indicate the presence of a direct relation between fast food and body weight (Binkley *et al.*, 2000, Pereira *et al.*, 2003).

Fast food is ubiquitously available and widely marketed to adolescents (Story *et al.*, 2002). Accordingly, the objective of the present study was to evaluate the effect of frequency of fast food consumption on the nutrition status of adolescent and youth groups.

MATERIALS AND METHODS

A random sample of 868 adolescents and youths aged 12-22 years, from clubs and youth centers in Alexandria city were randomly selected from July to September 2005. Data about fast food consumption were gathered by a questionnaire concerning frequency of food consumed away from home to identify subjects who frequently eat fast food and from others who eat less frequently such foods. Each subject was interviewed and asked about demographic and social situation (Fahmy & El-Sherbini, 1983), daily pocket money, habit and attitude toward fast food consumed. Nutrition status was assessed using mean daily dietary intake and anthropometric assessment. Dietary data were obtained using 24 hours recall method for three random consecutive days including a weekend. Weight and height were measured using standard methods to determine body mass index (BMI) which was derived from weight kg / height² m (Jelliffe, 1996). The nutritional status of adolescents was assessed using the obtained BMI and compared with the standard BMI/age established by (WHO, 1991), as follows: <5th percentile of the normal distribution indicated underweight or thinness, 5th - 85th percentile indicated normal weight, 85th - 95th percentile indicated overweight and ≥95th percentile for obese.

The centers for disease control and prevention defines childhood overweight as a BMI exceeding sex-and age-specific 95th percentiles and at risk of overweight as a BMI between the 85th and 95th percentiles using the 2000 growth charts (Kuczmarski *et al.*, 2000).

Nutritive values of diet were obtained using food composition Tables of Nutrition Institute (1996). Nutrition adequacy of diet was calculated by reference to the recommended daily allowances "RDA" (National Research Council, 1989).

Data were statistically analyzed using personal computers. Student t-test was used for comparison of means of a quantitative data and the chi-square test between two or more groups. Subjects were divided, according to frequency of fast food consumption, into two groups:

Group (1); subjects eat fast food frequently and group (2); subjects eat fast food less frequently.

RESULTS AND DISCUSSION

Sample characteristics

Nowadays, children and teenagers eat more meals away from home than they did twenty years ago. According to USDA (2000), fully 72% of teenage males and 64% of teenage females ate away from home on any given day. Meals eaten away from home contributed to approximately one third of these teens' daily energy and macronutrient intake.

Data in Table (1) show that the frequency of consuming food away from home was prevalent between both genders under study. The results presented in Table (1) show that 38.7% of subjects (39.6% males, 37.9% females) eat fast food frequently (group1) while 61.3% (60.4% males, 62.1% females) of them eat fast food less frequently (group2). The age averages of group1 and group2 subjects were 17.1±3.1 years and 16.4± 2.9 years, respectively and the difference between the two groups was statistically highly significant ($t=3.5$, $P<0.01$). It could be mentioned that all the subjects interviewed were students who received intermediate and high education level. Student teenagers spend long time away from home and hence are obliged to consume foods purchased from fast food restaurants. This agrees with the fact that adolescent and teenagers prefer to purchase fast food with their own money (Nestle, 2002).

Subjects eat fast food frequently and those eat such food less frequently did not differ in the socioeconomic background except in the regard of their father's and mother's education which was higher among those eat fast food less frequently. The difference was small between the two groups (1 and 2) in all other respects under comparison. As shown in Table (1), large differences were found between the parent's educations in both groups, on one hand about half 51.9% and 44% of both parents in group 2 had high education compared to 42.9% and 33.9% in group1 with a highly significant difference between them ($X^2= 6.7$ and $X^2= 12.2$, $P<0.01$). On the other hand, there was no significant difference between group1 (69%) and group2 (64.3%) concerning employment of mothers. In the present study, 46.4% of subjects of group 1 and 47% of group2 were of high economic level comparing with 30.4% and 35% of them belonged to low and very low level, respectively.

Data in Table (1) indicate that the mean daily pocket money of subjects of group 1 (2.0 ± 1.8 L.E) was significantly higher ($t = 3$, $P < 0.01$) than that of group 2, which was 1.7 ± 1.4 L.E. It could be noticed that pocket money of 19% in group 1 and 28.6% in group 2 was less than one L.E. Data indicated that pocket money of the highest proportion of subjects (42% in group 1 and 35.4% in group 2) was one L.E. These results are in general agreement with data reported by Osman (1997). The aforementioned results proved that daily pocket money of subjects (males and females) plays a major role in determining the frequency and type of fast food consumption, as with one L.E it is possible to purchase some plant protein fast food like stewed beans and bean burger (*foul and falafel*) due to their low price.

Anthropometric characteristics.

In 1989 (fast food fare), a published statement warned that a lifetime of fast food consumption may place children at increased risk for obesity. However, until recently, the poten-

tially adverse effects of fast food in youth have received limited attention in the medical literature (Shanty *et al.*, 2004). Some nutrition professionals argue that fast food is contributing to the obesity epidemic (St Onge *et al.*, 2003), whereas others support industry claims that fast food can be part of a healthful diet (Freeland-Graves & Nitzke, 2002).

From the results presented in Table (2), it could be observed that the mean weight and mean height of males were significantly higher than those of females in the two groups. A highly significant difference ($t = 2.9$, $P < 0.01$) in the mean weight and only a significant difference (2.3 , $P < 0.05$) in BMI were found between both groups. It could be mentioned that there was no significant difference in height between the two groups under study. The proportion of subjects with a BMI greater than 85th percentile was significantly higher ($t = 4.8$, $P < 0.01$) among group 1 (36.9%) than among group 2 (28.9%) indicating a risk of overweight and obesity. These findings exceeded the values reported

Table 1: Compared characteristics of the selected subjects

Characteristics	Group (1) eat frequently		Group (2) eat less frequently		Test of Significance
	No.	%	No.	%	
Total sample	336	38.7	532	61.3	
Gender:					
Male	164	39.6	250	60.4	
Female	172	37.9	282	62.1	
Age (years)					
12-<15	104	30.9	180	33.8	
15-<19	96	28.6	218	41.0	
19-22	136	40.5	134	25.2	
Mean \pm S.D	17.1 \pm 3.1		16.4 \pm 2.9		$t = 3.5^{**}$
Father education					
< primary	76	22.6	98	18.4	
Intermediate	116	34.5	158	29.7	
High	144	42.9	276	51.9	$X^2 = 6.7^{**}$
Mother education					
< primary	92	27.4	100	18.8	
Intermediate	130	38.7	198	37.2	
High	114	33.9	234	44.0	$X^2 = 12.2^{**}$
Mother occupation					
Employed	104	31.0	190	35.7	
Unemployed	232	69.0	342	64.3	$X^2 = 2.0$ N.S.
Socioeconomic level					
High	156	46.4	250	47.0	
Middle	78	23.2	96	18.0	
Low / very low	102	30.4	186	35.0	$X^2 = 4.1$ N.S.
Pocket money (L.E)					
<1	64	19.0	152	28.6	
1-	141	42.0	188	35.4	
2-	71	21.1	104	19.5	
3>	60	17.9	88	16.5	
Mean \pm S.D	2.0 \pm 1.8		1.7 \pm 1.4		$X^2 = 10.4^{**}$ $t = 3.0^{**}$

X^2 = Chi-square test

t = Student t-test

* = $P < 0.05$

N.S. = Not significant

** = $P < 0.01$

Table 2: Anthropometric characteristics of the selected subjects

Characteristics	Group (1) eat frequently			Group (2) eat less frequently			Test of Significance
	Males	Females	Total	Males	Females	Total	
Weight (kg)							
Mean	69.3	61.6	65.4	65.7	59.1	62.2	t = 2.9**
±S.D.	16.7	13.7	15.7	17.3	13.1	15.6	
Height (cm)							
Mean	172.0	159.7	165.7	169.7	159.7	164.3	t = 1.8 N.S.
±S.D.	11.1	11.4	12.8	10.1	6.7	9.8	
BMI							
Mean	23.3	23.8	23.6	22.7	23.1	22.9	t = 2.3**
±S.D.	4.6	4.4	4.5	5.3	4.7	5.0	
% under weight <5 th percentile	7.3	--	3.6	5.6	3.5 t = 7.5**	4.5	t = 0.0 N.S.
% normal <85 th percentile	54.9	64.0 t = 0.7 N.S.	59.5	67.2	66.0 t = 1.0 N.S.	66.6	t = 3.0**
% overweight & obese >85 th percentile	37.8	36.0 t = 1.5 N.S.	36.9	27.2	30.5 t = 2.33**	28.9	t = 4.8**

t = Student t-test

N.S. = Not significant

** = P < 0.01

among Irish teenagers in which only between 1.1% and 8.2% of subjects indicating a risk of overweight (Hurson & Corish, 1997). Specifically, males eat fast food frequently (37.8%) and females (36%) were found to have the highest prevalence of overweight and obesity with no significant difference compared with group eat less frequently in which only significant difference (t= 2.3, P<0.05) was observed between males (27.2%) and females (30.5%).

Researchers found that all teenagers tend to overeat when served a typical extra-large fast food meal, but normal-weight teenagers were more likely than overweight teens to make up for the overindulgence by eating less later on. Overweight kids tend to be less able to compensate for the extra calories in a fast food meal (Ebbeling *et al.*, 2004).

Nutrient intake

Subjects eat fast food frequently consumed high energy intake than subjects eat it less frequently as shown in Table (3). It is apparent that the mean daily energy intake of females in group1 (2031.4 kcal) and group2 (1849.7 kcal) was lower than that of males (2394.8 kcal and 2181.7 kcal) in both groups, respectively. Females in group1 and group 2 covered 92.3% and 84.1% of energy intake while males in group1 satisfying 85.3% and in group2 only 78.1%, respectively. Protein contributed about 16% of the energy intake; fat 26–28% and carbohydrate 61–62%, only minor differences were noted between both genders in the two groups under study. The mean daily protein intake of males and females exceeded the recommended

daily intake for both groups. On the other hand, males generally eat high intake of protein, fat and carbohydrate than females in both groups. In comparison with values reported in similar studies in United States (Ebbeling *et al.*, 2004 & Shanthy *et al.*, 2004), the values observed in the present study were higher. Fast food may increase energy intake, thus promoting a positive energy balance and increasing risk of obesity. This is due to the composition of typical fast foods as cheeseburgers, French fries and other foods popular among youth (Subar *et al.*, 1998).

Bell and Parnell (1996) reported that children who obtain most of their nutrients from meat, bakery products, dairy products, fat, sweets, snacks and fast food and consumed less fruits and vegetables are subjected to heart diseases and other diseases later in their life.

French *et al.* (2001) found that fast food consumption to be associated with higher total energy intake and poorer diet quality among adolescents in a Metropolitan area of Minnesota. Shanthy *et al.* (2004) found that adolescent girls who ate fast food consumed more total energy than those who ate fast food less frequently.

The prevalence of obesity in children has increased threefold or more during the last 3 decades raising serious public health concerns (National Center for Health Statistics, 2003). A number of environmental factors undoubtedly have contributed to this epidemic (Shanthy *et al.*, 2004). Furthermore, fast food is served in increasingly large portion sizes, which had been linked to voluntary energy intake (Rolls *et al.*, 2002).

Table 3: Mean \pm S.E of the daily intake and adequacy of the main three nutrients

Nutrients	Group (1) eat frequently		Group (2) eat less frequently	
	Males	Females	Males	Females
Total energy (kcal)	2394.8 \pm 51.9	2031.4 \pm 88.8	2181.7 \pm 40.3	1849.7 \pm 55.1
% of adequacy	85.3	92.3	78.1	84.1
Protein (g)	95.7 \pm 2.3	80.6 \pm 2.4	85.8 \pm 1.5	74.4 \pm 1.5
% of energy	16.0	15.9	15.7	16.1
% of adequacy	176.6	176.9	161.0	164.7
Fat (g)	74.9 \pm 2.1	63.2 \pm 1.9	64.2 \pm 1.5	56.3 \pm 1.0
% of energy	28.11	28.0	26.5	27.4
Carbohydrate (g)	359.5 \pm 9.0	311.3 \pm 18.4	340.5 \pm 7.1	280.6 \pm 11.5
% of energy	60	61.3	62.4	60.7

S.E. = Standard error of the mean

Habit and attitude toward fast food

It has been argued that adolescence is a period of opposition against everything even food habit (Anderson *et al.*, 1994).

Regarding habit and attitude toward fast food eaten by both genders as presented in Table (4), a highly significant difference ($P < 0.01$) could be traced between subjects eat fast food frequently and those eat less frequently. The results show that television advertisements have a significant influence on fast food consumption, 44.0–48.5% of the subjects eat fast food get their knowledge about fast food from television. Subjects were found to spend a lot of time watching television, which attract and maintain their attention to the advertised products making such products highly desirable. This agrees with the fact that children and adolescents spend a great deal of time watching television and hence being exposed to advertising for food products. Advertise is believed by manufacturer and marketers to be highly effective in selling particular products and have been shown in experimental studies to have an influence on food choice of children and adolescents (Adler *et al.*, 1997).

The results shown in Table (4) indicate that summer is the most season through which consumption of fast food increased among subjects eat frequently (41.1%) and those eat less frequently (42.1%) with a highly significant difference between them ($X^2 = 13.04$, $P < 0.01$). This is due to the fact that youth spend their summer holiday in clubs and beside beaches. They spend long time outdoors and hence have a chance for consuming additional meals outside homes. This was in agreement with the fact that outside home in clubs, restaurants, school cafeteria or street were favorable places for eating fast food among the subjects under study, it was more

common among subjects eat frequently (81.5%) than ones eat less frequently (76.7%), and also those places were suitable to meet their friends.

As regard the reason for eating fast food, the results in Table (4) show that more than half of subjects eat fast food as a sort of change. This reason was slightly lower among subjects eat frequently (51.8%) than subjects eat less frequently (52.6%). It is worth to mention that work of mothers was the least reason for eating fast food among group 1 (4.2%) and group 2 (6.8%). Concerning subjects knowledge about the nutritive value of fast food, there was a highly significant difference between both groups ($X^2 = 14.12$, $P < 0.01$). The results reveal that 24.4% of subjects eat frequently and 15% of subjects eat less frequently assumed that fast food have a good nutritive value, while 38.1% and 36.8% presumed that nutritive value is moderate. On the other hand, 14.9% of group1 considered fast food of poor nutritive value compared with 20.7% of group2.

Regarding beliefs about health effect of fast food, there was a highly significant difference between both groups ($X^2 = 14.3$, $P < 0.01$), only 22% of subjects eat fast food frequently and 31.2% of those eat less frequently believe that fast food can cause disease. In contrast, 41.7% of subjects eat fast food frequently and 43.2% of subjects eat less frequently believe that fast foods are harmless. It was also noted that 36.3% of subjects of group1 and 25.6% of group2 did not know if fast food can cause any health hazards or not.

A recent survey directly questioned young people about their most important consideration when deciding what to eat; taste and quality were found to be primary, while cost and health concerns were of secondary importance (Adler *et al.*, 1997).

Table 4: Distribution of subjects according to habit and attitude toward fast food

Items	Group (1) eat frequently		Group (2) eat less frequently		Test of significance
	n = 336		n = 532		
	No.	%	No.	%	
Sources of information about fast food					
Families	44	13.1	60	11.3	X ² =3.5 N.S
Friends	80	23.8	134	25.2	
Television	148	44.0	258	48.5	
Television & Friends	64	19.1	80	15.0	
Season of increased eaten fast food					
Summer	138	41.1	224	42.1	X ² =13.04**
Winter	68	20.2	156	29.3	
All year round	130	38.7	152	28.6	
Place of eating fast food					
Inside home	62	18.5	124	23.3	X ² =2.9 N.S
Outside home	274	81.5	408	76.7	
Reasons for eating fast food					
Work of mother	14	4.2	36	6.8	X ² =3.01 N.S
Sort of change	174	51.8	280	52.6	
During school and private lesson	148	44.0	216	40.6	
Beliefs about health effect of fast food					
Cause disease	74	22.0	166	31.2	X ² =14.29**
Harmless	140	41.7	230	43.2	
Do not know	122	36.3	136	25.6	
Nutritive value of fast food					
Good	82	24.4	80	15.0	X ² =14.12**
Moderate	128	38.1	196	36.8	
Poor	50	14.9	110	20.7	
Do not know	76	22.6	146	27.5	
Taste of fast food					
Excellent	148	44.0	218	41.0	X ² =5.2 N.S
Favourable	186	55.4	300	56.4	
Bad	2	0.6	14	2.6	
Price of fast food					
High	62	18.4	118	22.2	X ² =16.1**
Moderate	272	81.0	386	72.5	
Low	2	0.6	28	5.3	

X² = Chi-square test

** = P < 0.01

N.S. = Not significant

The results shown in Table (4) indicate that 55.4% and 56.4% of subjects of group1 and group2 considered the taste of fast food favorable, while 44% and 41% of them noted that the taste was excellent. Also, 81% of subjects eat frequently and 72.5% of those eat less frequently considered that the price of fast food is moderate comparing with only 0.6% of group1 and 5.3% of group 2 who indicated that the price was low.

Types of fast food consumed

Concerning order of popularity of fast food consumed, the data in Table (5) show

that the consumption of animal protein was high (89.3%) among group eat frequently followed by plant protein (71.4%), bakery products (46.4%) and the least was French fries (38.7%). While among group eat fast food less frequently, plant protein was high (91.7%) followed by 29.3% and 21.4% for animal protein and French fries, respectively, while consumption of bakery products was tailing behind being 15.8% only.

High daily pocket money of subjects eat fast food frequently is linked with the high consumption of animal proteins which cost high

Table 5: Distribution of subjects according to types of fast food eaten

Nutrients	Group (1) eat frequently		Group (2) eat less frequently	
	No	%	No	%
French fries	130	38.7	114	21.4
Bakery products	156	46.4	84	15.8
Plant protein	240	71.4	488	91.7
Animal protein	300	89.3	156	29.3

price than plant proteins. On the other hand, subjects eat fast food less frequently were more likely to consume plant proteins because of its relatively cheap price. It is noticed that within animal proteins the most common types consumed were hamburger, liver, *sheish tawook*, *kofta*, fried chicken and *shawerma*. Beans (*foul* and *falafel*) were the favorite and most popular types of plant proteins consumed followed by *koshary*. While variety of bakery products were pies, pizza, croissant and cake. This finding is in accordance with those found by Osman (1997). The ubiquities of fast food establishments may account for the high level of consumption of those foods. Youth of higher socioeconomic status may have more discretionary money and consequently greater access to fast food.

Based on the previously results, it could be concluded that with the increase of fast food establishments, consumption of fast food among youth has increased. Teens' growing independence and busy schedules often mean fewer meals with the family and more food purchased from fast food restaurants and school cafeteria. These are the most frequent sources for outside food for males and females and offer a brightly coloured environment and a place to meet friends. Food eaten away from home may be less nutritious than home meals, generally poor, lacking essential nutrients, high in fat, salt and sugar. Increase in the family's income which reflect the increase daily pocket money of youth, socio cultural factors and the mass media especially televised food advertisement have played an important role in increasing the consumption of fast food. Fast food consumption among youth affects diet quality in ways that increase risk for obesity. Although the causes of obesity are multifaceted, public health measures to limit fast food consumption in children and adolescent may be warranted. Such measures could include nutrition education campaigns, legislation to regulate marketing of fast food to children, and elimination of fast food from schools.

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