

Dietary Intake and Physical Activity of Adolescents at some Regions in Tripoli Libya

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الحالة التغذوية والنشاط البدني للمراهقين في بعض مناطق طرابلس - ليبيا

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المستخلص:

أجريت هذه الدراسة لتحديد المتناول الغذائي ومستوى النشاط البدني للمراهقين الذين تم اختيارهم عشوائياً من بعض المدارس الثانوية المختلفة في طرابلس ليبيا. تم استخدام استبيان منظم تم اختياره مسبقاً، وقياسات الأنثروبومترية لتناول الطعام ومستوى النشاط البدني لـ 370 مراهقاً تتراوح أعمارهم بين 11 و18 عاماً من 183 ذكراً و187 أنثى. أوضحت أن غالبية المراهقين كانوا في المرحلة الثالثة من المرحلة الثانوية، حيث بلغ متوسط قيمة مؤشر كتلة الجسم (BMI) للإناث 18.9 ± 3.1 كجم / م² حيث اختلف بشكل كبير عن الذكور 17.9 ± 2.0 كجم / م². النشاط البدني كان متوسطاً للمراهقين حيث كان النشاط البدني للذكور أكبر من الإناث خلال عطلة نهاية الأسبوع وبعد المدرسة بنسبة 40.98% و88% على التوالي، وأيضاً خلال الثلاث أيام من الاستبيان تبين أنه نسبة كبيرة من المراهقين خلال نهاية الأسبوع تشاهد التلفاز أو تلعب بالفيديو والكمبيوتر بنسبة 81.28% و70.49% على التوالي. الوجبات الخفيفة كانت هي الأكثر شيوعاً واستهلاكاً بشكل رئيسي، حيث كانت شطائر الخبز 77.57%، والبسكويت والكعك 70.27% والشوكولاتة ورقائق البطاطس 68.39%، بينما كانت الأطعمة المقلية والمشروبات الغازية منخفضة جداً بنسبة 26.22% و22.76%. البيانات المتحصل عليها بينت أن متوسط استهلاك الطاقة كان لكل من الذكور والإناث أقل من 2/3 من المسموح الغذائي الموصي به (RDA) 49.3 ± 6.6 و50.3 ± 6.1 على التوالي. فيتامينات A و E و B1 والكالسيوم والمغنيسيوم والألياف كانت أقل من RDA عند نسبة كبيرة من المراهقين، كما كان الحديد كذلك أقل بحوالي 3/2. عليه يجب أن يركز إنشاء البرامج المدرسية على تعزيز التغييرات في تناول الطعام من خلال توفير مصدر جيد للطاقة وزيادة النشاط البدني في جميع المدارس الثانوية.

الكلمات المفتاحية: الحالة التغذوية، النشاط البدني، ذكور، إناث، المراهقون طرابلس، ليبيا

Abstract:

This study was conducted to determine the dietary intake food consumption and physical activity level of adolescents randomly selected from some different high school in Tripoli Libya. Using pre-tested structured questionnaire on back gown, anthropometric measurements food intake and physical activity level of 370 adolescents aged 11 -18-years old comprising 183 males,187 females. Results showed that the majority of

adolescents were at 3rd high school level, an average females Body Mass Index (BMI) value was $18.9 \pm 3.1 \text{ kg/m}^2$ differed significantly from males $17.9 \pm 2.0 \text{ kg/m}^2$. Adolescents were at moderate physical activity, males were physically active more than females during weekend and after school 40.98% and 88%, respectively. How were in all three days interview the majority of adolescents had higher frequency count of just watching TV on weekend and playing video and computer 81.28% and 70.49% respectively. Snacks were most popular and mainly consumed, as bread sandwich 77.57%, biscuits and cakes 70.27% and chocolates and chips 68.39% while fried food and carbonated drinks were very low 26.22% and 22.76%. Collected data indicated that the mean intake of energy in both males and females were below 2/3 of Recommended Dietary Allowance (RDA) 49.3 ± 66 and 50.3 ± 6.1 , respectively. Vitamins A, E, and B1, Calcium, magnesium, and fiber were below RDA in large proportion of adolescents, Iron as well was below about of 2/3. Establishment of school programs should be focused on promoting changes in food intake by providing good source of energy and increasing physical activity in all high schools.

Keywords: *food intake, physical activity, males, females, adolescents Tripoli, Libya*

Introduction:

Adolescents is a critical period in the life span, characterized by major physical, chemical, and emotional changes. Adolescent used to learn healthy eating arrangement during a period of life, which will lead them to healthy nutritional status (Afzal et al., 2017; Arazi & Hussein, 2012). Human life health depend on appropriate diet and regular physical activity. Nutrients of body energy and tissue need changes through the life cycle from child hood to old age (Meredith & Dwyer, 1991). A study demonstrates that suitable physical activity and healthy diet are main factors for maintenance good health all the way through the entire life (Bergier et al., 2014). The main reasons of raised blood pressure and blood glucose, abnormal blood lipids, overweight obesity and for the chronic diseases were unhealthy diets and poor physical activity (Barzegar et al., 2012). Physical activity during adolescents crucial as it contributes to normal health growth development and protective agent's chronic disease (Cavadini et al., 2000). Extensive evidence confirms that proper diet and regular activity for adolescents promoting health and prevent disease (Dietary-Guidelines-for-Americans, 2010). In many countries rapid economic development has brought changes in population dietary intake and life style they shift towards westernized diet pattern and sedentary life style which has been indicated in the increasing rate of overweight and obesity (Tsintsifa et al., 2006). In Tripoli-Libya dietary studies on adolescents are fewer compared with those on young adults. Thus the purpose of the study was to report the dietary intake and physical activity among adolescents in some area of the City.

Material and Methods:

A total of 370 adolescents aged 11-18 years old randomly selected from different high school in area of Tripoli-Libya. Subjects gathered from first to third high school (183 males and 187 females), agreed to participate in this study, they were interviewed using pretested structured, questionnaire on back ground, food bracts intake and physical activity. Anthropometric measurements height and weight were taken. Height was measured to the nearest centimeter without shoes. Weight was done wearing minimal cloths and bare footed, and recorded to the nearest 0.1 kg with portable digital scale

(Enes & Slater, 2013). All measurements were performed by two trained healthy workers one for taking the measurements and the other one record the reading. BMI was calculated based on the weight and the height measurements (equal the weight in kg divided by the square of height in meter) normal weight was defined as BMI between 5th and 85m percentiles as risk for overweight, and overweight were defined as BMI between 85 and 95 and greater (Enes & Slater, 2013, Taber, et al 2013). Physical activity questionnaire was assessed level of light, moderate to vigorous on physical education day and weekend, a list of activity (i.e. jogging, running ...etc). The scoring system was adapted to determine the physical activity with some modification. Data of nutrients intake was collected within 24 hours dietary recall .In the 24-hour dietary recall the participants report all the nutrients drinks and dietary supplements. They were asked to record each type of food and beverage taken for three days including weekend, they had to estimate the amount of every food used to correct the amount of consumed food in the food record questionnaire. The amount of each ingredient used in the recipes was estimated by the measuring cups, and spoons that used in. Local recipes of commonly eaten foods recorded by subjects and each estimated amount consumed was then converted into grams using list of commonly consumed food with known for each portion size, the average Daily nutrients intake was calculated for each subjects using Institute of Medicine Food and Nutrition Board (National Research Council, 1989).

Results:

Data listed in Table1 showed that the sample studied were 49.46% males and 50.54% females. the majority of adolescent males and females were at age 13-14 years old represented .32.16% while the lowest percentages were at age 11–12 years old, which was 11.69%.

Table1. Population Characteristic

Characteristic	No 370	%
Male	183	49.46
Female	187	50.54
Age		
11--- 12	44	11.89
13 ---14	119	32.16
15 ---16	103	27.84
17 ---18	104	28.11
Education Level		
1	87	23.51
2	65	17.57
3	218	58.92

Table 2 Indicated that the mean weight and \pm SD was 42 ± 10 kg, for males and 43.2 ± 7.0 kg for females.

Table 2. Body weight, height and body mass index of adolescents by age

Measurements	Mean \pm SD Male = 183	Mean \pm SD Female= 187	Combined = 370
Body Weight (kg)	42 ± 10.1	43.2 ± 7.0	42.4 ± 9.0
Height (cm)	1.52 ± 0.10	1.48 ± 9.0	1.50 ± 0.08
BMI (kg/m^2)	17.9 ± 2.0	18 ± 1.3	18.3 ± 2.8

Dietary Intake and Physical Activity of Adolescents at some Regions in Tripoli Libya(233-240)

Figure 1 showed that more than half of total sample adolescents (65.68%) were represented in moderate physical activity level while only on 3.24 % of total sample were represented in the high physical activity level. This could be observing that males were more physically active than females and more time spent on activity.

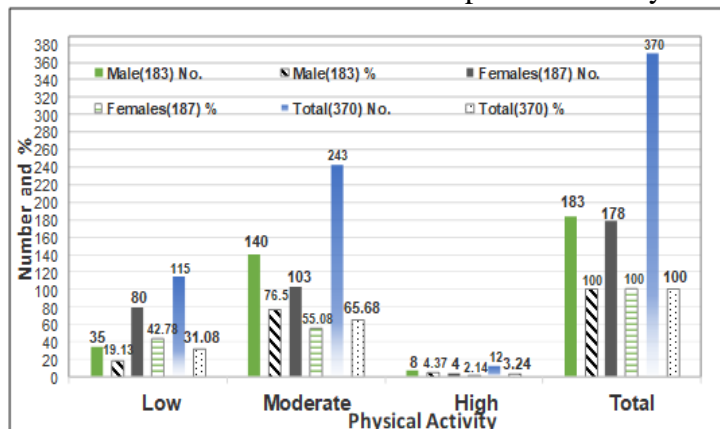


Figure 1. Distribution of Adolescents by gender and level of physical activity

Figure 2 showed that the proportion of males 43.72% and 45.36% engaged in physical activity four times or more per week after school and weekend was higher than female adolescents which were 16.04 % and 18.72 %, respectively.

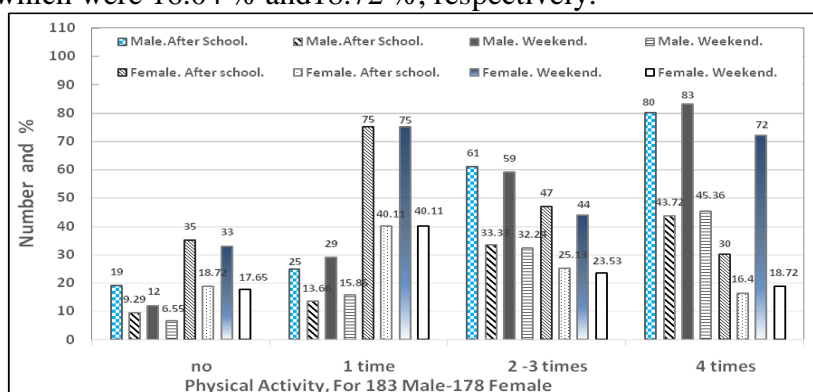


Figure 2. Distribution of Adolescents according to frequency of participation in physical activity after school and weekend.

Table 3. Distribution of subjects, watching TV, video, Computer on education day and weekend

Activity	Freq.	Ph. .Ed .D Male= 183		Ph. .Ed .D Female =187		Weekend Male=183		Weekend Female =187	
		No	%	NO.	%	NO.	%	No.	%
W. TV	NO	73	39.04	20	10.93	10	5.35	21	11.48
W. TV	1- 2D	100	53.48	108	59.02	25	13.37	33	18.03
W. TV	> 3D	14	7.49	55	30.05	152	81.28	129	70.49
Play Video, Comp.	NO	122	65.24	112	61.20	110	58.82	122	66.67
Play Video, Comp.	1-2D	43	22.99	54	29.51	50	26.74	41	22.40
Play Video, Comp.	>3D	22	11.76	17	9.29	27	14.44	20	10.93

W=watch, TV = Television, Ph.= physical activity, Ed= education, D = day

Dietary Intake and Physical Activity of Adolescents at some Regions in Tripoli Libya(233-240)

Table 4 Indicated the snack consumption pattern, that the most frequently mentioned snack taken by total samples.

Table 4.Snakes Consumption among males and female adolescents

Food intake for snacks	Males=183		Females=187		Total	
	No	%	No	%	No	%
Bread Sandwich	150	81.97	137	73.26	287	77.57
Biscuits and cakes	135	73.77	125	66.84	260	70.27
Chocolate , Candy	141	73.04	112	59.89	253	68.39
Ice Crème	82	44.81	71	37.96	153	41.35
Local Sweets	96	52.46	77	41.18	171	46.76
Fruits and vegetable	55	55.05	81	42.78	135	36.49
Fried food and local	96	52.46	48	25.67	97	26.22
Carbonated Drinks	71	38.79	28	14.97	99	26.76
Pisa and Ships	94	51.37	73	39.04	16	45.14

Table 5 demonstrated that the mean intake of energy per day was low in both males and female adolescents.

Table 5. Mean daily energy and nutritional intake per day of adolescent by gender

Nutrients	Males=183	Females= 187
Energy (kcal)	1961	1664
Carbohydrate (g)	234 ±10.2	203 ±6.2
Protein (g)	79.4 ±2.02	61 ±1.00
Fat (g)	75 ±3.01	64.3 ±2.54
Fiber (g)	20.1 ±0.87	19.1 ±0.88
Cholesterol (mg)	302.3 ±1.15	258 ±14.2
Vitamin A (mg)	429 ±59.4	432 ±52.3
Vitamin C (mg)	86.4 ±5.92	85.2 ±54.1
Vitamin E (mg)	8.9 ±0.57	9.5 ±0.56
Thiamin (mg)	0.8 ±0.03	.17 ±.01
Riboflavin (mg)	1.5 ±0.08	1.1 ±0.04
Vitamin B6 (mg)	1.2 ±0.04	1.2 ±0.04
Folic Acid (mg)	130 ±6.7	206 ±6.7
Calcium (mg)	733 ±24.8	600 ±24.1
Phosphorus (mg)	733 ±24.8	927 ±31.7
Iron (mg)	12.2 ±0.41	8.8 ±0.33
Zink (mg)	12.6 ±0.52	8.0 ±0.19
Magnesium (mg)	197 ±7.8	258 ±11.3

Discussions:

The education level of these study samples (more than half) were at third level grade 58.92% and the lowest percentage was 17.57% at the second grade as stated in table 1.Results in Table 2 showed that there was no significant difference in the mean height and body weight between the males and females. However the average female BMI value was $18.9 \pm 3.1 \text{ kg/m}^2$ differed significantly from that of male at $17.9 \pm 2.0 \text{ kg/m}^2$, Based on the criteria of (WHO, 2005).

Figure2 explained that more males 33.33 % and 32.24 % were physically active 2 – 3 times per week than females 25.13% and 23. 53 % respectively. The activity spent such as walking to school, play football or cycling. The present study established that females' adolescent participant in physical activity one time per week after school and weekend for represented 40.11% for both. Low percentages about 9.29% and 6.55% males, 18.72 % and 17.65% females after school and weekend, respectively were found not participated in physical activity this finding were in agreement with study by (Alsufiani et al., 2015; Moreno et al., 2008). Adolescents were at moderate physical activity, males

were more actively than females during weekend and after school day (Castetbon et al., 2009; Institute-of-Medicine, 2000). (Bicer & Alsaffarb, 2016) Concluded that energy intake and physical activity level were found to be associated to the BMI of the adolescents with autism spectrum disorder (ASD). Differences in activities among males and females may be due to recent socialization patterns for males and females which may limit opportunity and accessibility of certain type of activity.

Results recorded in Table 3 was in all three days of interview, the majority of total samples of adolescent which had the frequency count 81.25 % and 70.49% just watching TV on weekend, also the same trend were found that playing video and computer gave the highest frequency count on weekend, these results agreed with studies by (Joshi & Gautam, 2002; Manz et al., 2019; Patriaca et al., 2009; Roland-Cachera et al., 2000). Very few participants did watch on physical education day which was 7.49% and 30.05%. the result revealed that the high percentages of total sample did light activities.

For snack consumption pattern (Table 4) the most frequently mentioned snack taken by total samples in between main meals were bread sandwich 77.57%, biscuits and cakes 70.27% and chocolate and candy 68.39%, followed by Pizza and chips 45.14%, ice cream 41.35%. the lowest intake was fried and local foods 26.22% of total sample respectively. However more than half of males were consumed pits' 51.37%, Local sweets 52.46% and fried food 52.46%. Carbonated drinks were higher in males than females represented 38.79% while the consumption of vegetables were higher in females than males 42.78% than males 30.05% respectively. Study showed that relations of nutrient intake, male adolescents with ASD were not at a greater hazard when compared to the typically developing colleague (Bicer & Alsaffarb, 2016). Data indicated that the female adolescents tend to choose healthier diet compared with males, which indicates that males should focus on reducing unhealthy behaviors such as, eating patterns and videogames. However Table 5 demonstrated that the mean intake of energy per day was low in both males and female adolescents. The energy was below 2/3 of RDA, 50.3 ± 6.1 males and 49.3 ± 6.6 for female adolescents respectively. The distribution of macronutrients in daily energy consumption was in line with the RDA needed. As for carbohydrate it was found to meet almost half of daily energy requirement in both males and females while protein intake was found to meet 16% of daily energy in males and 15% in females (34% of energy came from fat food). The study revealed that the carbohydrate, protein intake was appropriate while the fat was too high, the excess of fat content of diet was found due to excessive intake of food rich in carbohydrate and fat such as cookies, cakes fried potatoes, pasta and starchy meals. The Table showed that fiber intake was inadequate in large proportion of adolescents 20.1 ± 0.87 and 19.1 ± 0.88 for males and females, respectively. It was observed that Vitamins A and C had no difference between the intake for males and female adolescents. According to the study it was found that Calcium, Magnesium, Folic acid, Vitamin A and E, Thiamine, were inadequate lower than RDA in the majority of adolescents. Iron were below 2/3 of RDA in female adolescents. This may be explained by the low consumption of iron rich food ex meat, legumes, green vegetables. This indicated that the majority of adolescents were consumed more westernized than natural food (Alsufiani et al., 2015; Institute-of-Medicine, 2005).

Conclusions:

A regular physical activity and balanced diet are the most cost effective and important preventative measured. Results indicated that most of adolescents were at moderate physical activity, males were more active than females during weekend and after school day. Majority of total sample had higher frequency count of watching TV and playing videogames. Most of adolescents were consume bread sandwich as, biscuits, cakes and chocolates, while carbonated drinks and fried food were at low consumption, and consumed a diet which 2/3 lower than RDA. Using physical activity questionnaire that may exactly cover all the physical activities of adolescents in entire city of Tripoli is one of main recommendations by this study.

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