Survey of dietary habits of in-school adolescents in Damascus, Syrian Arab Republic

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دراسة مسحية للعادات الغذائية لدى المراهقين في مدارس دمشق — سورية

هيام بشور

الخلاصة: كانت الغاية من هذه الدراسة وصف العادات الغذائية لدى المراهقين السوريِّين في المدارس الثانوية في دمشق والمناطق المحيطة بها. وهي دراسة وصفية مستعرضة أُجرِيَتْ عام 2001 وشملت 3507 تلاميذ، أخذوا على شكل عينة عشوائية مُتطبقة عنقودية ذات مرحلتين. وقد سُئِل التلاميذ أن يَصِفوا النموذج الاستهلاكي لأصناف الطعام خلال الأسبوع المنصرم، فقال أكثر من 50٪ منهم إنهم لم يتناولوا الخضراوات الطازجة، فيما قال أكثر من 35٪ منهم إنهم لم يتناولوا اللحوم، وقال أكثر من 35٪ منهم إنهم تناولوا الجبن والحليب مرة واحدة في اليوم على الأقل، في حين قال 11.8٪ فقط منهم إنهم تناولوا الفواكه 3 مرات في اليوم أو أكثر. وقد تمَّ تحليل المحدِّدات المحتملة لنموذج الاستهلاك الغذائي، كما وُصفت الممارسات المتَّبعة في إنقاص الوزن، والعادات الأخرى في تناول الطعام.

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ABSTRACT This study aimed to describe dietary habits of Syrian adolescents attending secondary schools in Damascus and the surrounding areas. A descriptive, cross-sectional study was carried out on 3507 students in 2001. A stratified, 2-stage random cluster sample was used to sample the students. The consumption pattern of food items during the previous week was described. More than 50% of the students said that they had not consumed green vegetables and more than 35% had not consumed meat. More than 35% said that they consumed cheese and milk at least once a day. Only 11.8% consumed fruit 3 times or more daily. Potential determinants of the pattern of food consumption were analysed. Weight control practices and other eating habits were also described.

Enquête sur les habitudes alimentaires d'adolescents scolarisés à Damas (République arabe syrienne)
RÉSUMÉ Cette étude avait pour objectif de décrire les habitudes alimentaires d'adolescents syriens fréquentant des écoles secondaires à Damas et dans ses environs. Une étude transversale descriptive a été réalisée auprès de 3507 élèves en 2001. Un échantillonnage aléatoire en grappes stratifié à deux degrés a été utilisé pour répartir les élèves. Les caractéristiques de la consommation des aliments durant la semaine précédente ont été décrites. Plus de 50 % des élèves déclaraient n'avoir pas consommé de légumes verts et plus de 35 % n'avaient pas consommé de viande. Plus de 35 % déclaraient avoir consommé du fromage et des laitages au moins une fois par jour. Seuls 11,8 % des élèves consommaient des fruits trois fois par jour ou plus. Les déterminants potentiels de la consommation alimentaire ont été analysés. Les pratiques de contrôle du poids et les autres habitudes alimentaires ont également été décrites.

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Introduction

The quantity, strength, and consistency of evidence that relates dietary factors to chronic diseases, and the substantial impact of these conditions on health are reason enough to promote policies to increase the adoption of healthy diets [1,2].

The health of young people and adults is critically linked to the health-related behaviours they choose to adopt. Unhealthy dietary behaviour is one of those risky behaviours. Evidence from studies of the eating habits of young people raises concern about the implications on their future health [3].

The Syrian Arab Republic is a country witnessing great developments. It is also facing a clear epidemiological transition; chronic diseases are emerging as the main causes of death (Syrian Ministry of Health, unpublished report, 2000). The population of the country is rather young: the age group 10–19 years constitutes more than 25% of the total [4]. The net enrolment at secondary school is 40% for males and 45% for females [5].

Adolescents may not think of the long-term consequences of their health practices, rather, they consider only short-term consequences and assume they can alter their habits later for better health [3]. An analysis of dietary habits among adolescents would be useful in depicting prevalent habits, and also for designing relevant effective nutrition education recommendations. As far as is known, there are no previous studies in the Syrian Arab Republic that describe eating habits among adolescents, although other risky behaviours have been studied, e.g. smoking [6].

This study aimed to describe dietary habits of Syrian adolescents attending secondary schools in Damascus city and the surrounding areas.

Methods

The study was conducted in Damascus and surrounding areas. Damascus, the capital of the Syrian Arab Republic, has a population of > 1.5 million [4]. It constitutes one of the 14 provinces in the country and is surrounded by another province called Rural Damascus, with a population of < 2 million [4]. The total number of secondary schools (grades 7–12) in the 2 provinces approaches 400, the vast majority of them government schools.

This was a descriptive, cross-sectional study. A stratified, 2-stage, random, cluster sample was used to sample the students. In the first stage, schools were randomly selected from a sampling frame that included all schools (grades 7–12) in Damascus city and Rural Damascus (only 30 km around Damascus city). That frame was stratified by education level (2 strata), sex (2 strata) and place of residence (2 strata). Three schools from each stratum were randomly selected, i.e. 24 schools in total. Classes from each level of education in the selected schools were randomly chosen. Students in the 9th and 12th grades were not as well represented as other grades owing to the fact that some class teachers refused to allow any interruption in their classes since the students were registered for important exams in June of the same year. In the schools where this occurred (5/24 schools), we replaced that class with the class from the grade below. All students attending the selected classes were included. The sample size was estimated at 3380 taking into account: desirable confidence limit of 95%; an estimated prevalence of an unhealthy eating habit of 40%; the acceptable error; and the design effect of 1.5. Initial sample size was 3514 in-school adolescents; 5 students refused to participate and

2 questionnaires were returned blank. The total number of questionnaires analysed was 3507.

The questionnaire was developed and adapted from the questionnaire used for the behavioural risk factor surveillance system [7]. This modified questionnaire was piloted on 25 secondary students to check for ease of understanding and completion. The questionnaire consisted of 54 questions. Data collected included background information; food consumption and frequency of the main food items consumed in the past week; weight perception and weight control measures practised; reported weight and height if known by the student; habits of consuming products such as salt, coffee, tea, soft drinks and packaged food (e.g. biscuits, potato chips); and also snacking habits. A question on the perceived best authority to provide health education on nutrition was also included.

Students filled in the questionnaires during regular class times, and questionnaires were also collected in class. The principal investigator visited all the selected schools between February and May 2001. Approval of the school principals was obtained before the start of the study, and written, informed consent was taken from all the students through the tool of data collection itself.

Questionnaires were checked and coded, and analysis of data was carried out using *SPSS*. Missing values were allowed for in the analysis. Descriptive statistics was carried out where frequencies were calculated for all questions. Comparisons between sexes and place of residence were also done. The chi-squared test to compare proportions and *t*-test to compare means were calculated. The level of significance was 0.05.

Results

A total of 3509 students in 24 secondary schools in Damascus and surrounding areas received the questionnaire (5 adolescents had refused to participate). Participation rate was extremely high, only 2 questionnaires were returned blank leaving a total of 3507 questionnaires. Table 1 summarizes the characteristics of the participants: 73.2% resided in urban areas, 41.7% were female, and age range was 13–18 years. More than 36% earned money through work; this proportion varied significantly between males and females (59.7% and 20.9% respectively).

Figure 1 shows the frequency of food consumption in the week preceding the day of the school visit. More than 50% did not consume green vegetables, about 35% did not consume red meat and 40% did not consume red meat at all during that week. More than 35% said that they consumed cheese and milk once a day. Only 11.8% consumed fruits 3 times or more daily in the previous week. The average number of meals consumed per day as reported by students was 2.58 (standard deviation [SD] 0.78). Those who reported the intake of only 1 meal per day constituted 7.7% of the study subjects.

The frequency of food consumption was analysed according to age group, sex, place of residence, perceived economic status of the family, and whether the student earned money through work. Table 2 shows the results for 2 food items only, fruits and green vegetables. These were selected because of their special importance. An analysis of other items is not shown here for space reasons. For this analysis, the frequency of food consumption was recoded into 2 groups: inadequate con-
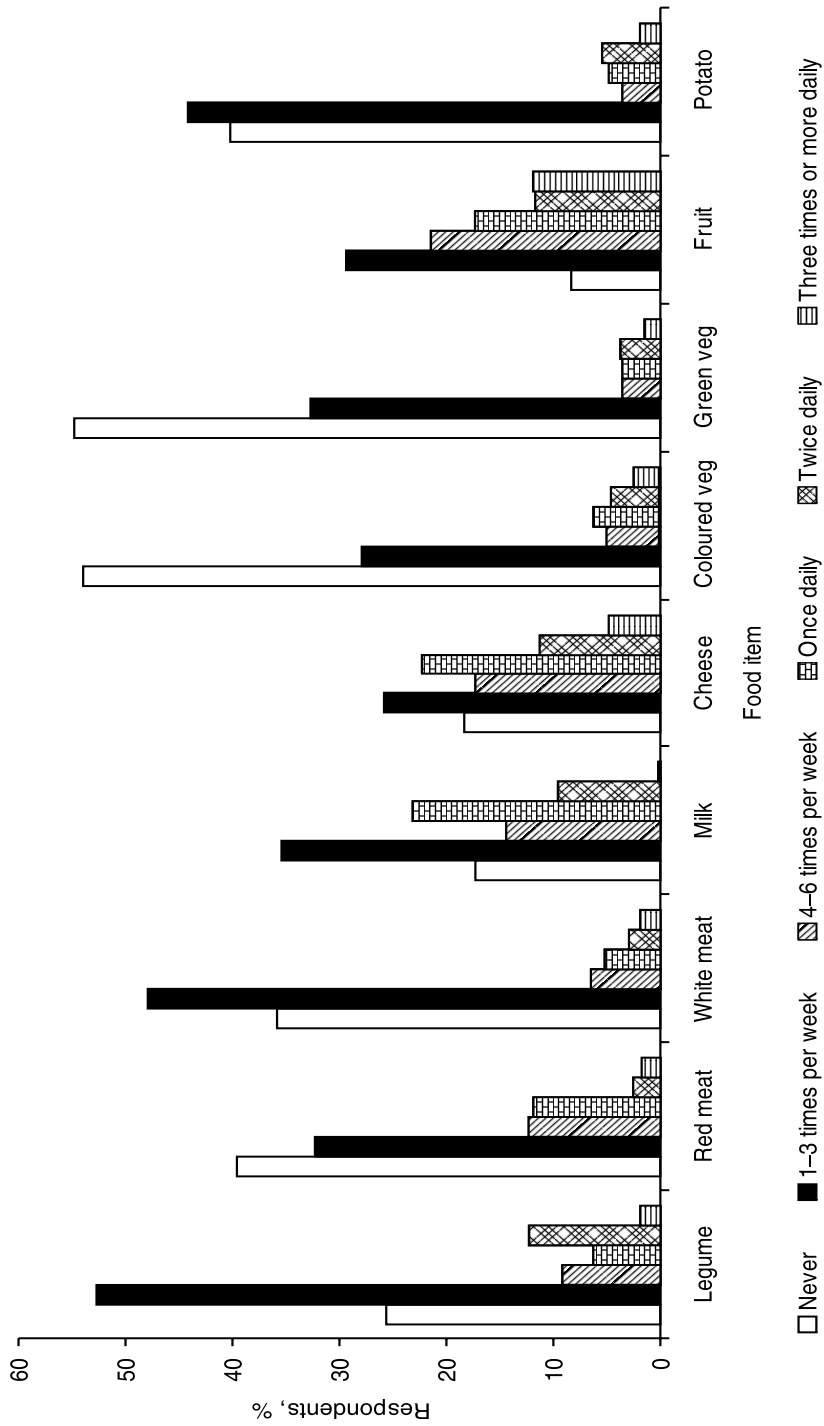
Figure 1 Frequency (%) of food consumption among in-school adolescents

Table 1 **Characteristics of the study subjects** (*N* = 3507)

Characteristic	No.	%
Residence		
Damascus	2568	73.2
Surroundings	939	26.8
Age (years)		
13	730	20.8
14	576	16.4
15	696	19.8
16	695	19.8
17	654	18.6
18	145	4.1
Sex		
Male	1461	41.7
Female	2046	58.3
School grade		
7th	652	18.6
8th	652	18.6
9th	350	10.0
10th	863	24.6
11th	627	17.9
12th	363	10.4
Perceived economic status of family		
Low	152	4.3
Moderate	1984	56.6
Good	1229	35.0
Earning money through work		
Yes	1240	35.4
No	2116	60.3

Missing data for some questions means that some values for total number of respondents are different.

sumption (< 1 time daily during the past week), and adequate consumption (consumed ≥ 1 time daily during past week). As can be seen from Table 2, the consumption of fruit differed significantly with perceived economic status and earning money, while the consumption of green vegetables differed significantly with age, sex, place of residence, perceived economic status and earning money. All these variables were included in a multivariate logistic regression analysis, where the dependent variable was the adequacy of fruit/vegetable consumption. The only predictor for the inadequacy of fruit consumption was economic status as perceived by the student (OR = 0.7 for the highest economic status, 95% CI: 0.47–0.99). Low vegetable consumption was, however, related to sex (OR = 0.65 for males, 95% CI: 0.56–0.76) and age (OR = 0.79 for the younger age group, 95% CI: 0.69–0.91) and place of residence (OR = 1.61 for urban residence, 95% CI: 1.36–1.89).

Table 3 demonstrates how the students perceived their weight when they were asked to describe it. It also shows their plans to control their weight and whether they actually did that in the previous month. The mean body mass index (BMI) of 19 males who reported their weight and height and who described themselves as being slightly overweight was 24.6 kg/m^2 (SD = 4.4), and the mean BMI of 223 females in the same group was 22.6 kg/m^2 (SD = 2.5). According to the World Health Organization, BMI 25.0–29.0 kg/m^2 is defined as overweight and BMI ≥ 30 kg/m^2 is obese [*8*]. Of 882 students who actually controlled their weight in the previous month, 806 described their method. Changes in diet and/or doing exercises were reported by 705 students. Only 101 students said that physical activity and exercise were the only method of weight control they embarked on. Significant differences between males and females regarding weight management practices were noticed (Table 3). When the results were analysed by place of residence, no differences were found. Of the 1882 (54%) students who stated their weight and height on the questionnaires,

Table 2 **Differences in frequency of food consumption of selected items by demographic and socioeconomic characteristics**[a]

Characteristic	Fruit consumption				Green vegetable consumption			
	Adequate[b]		Inadequate		Adequate		Inadequate	
	No.	%	No.	%	No.	%	No.	%
Age (years)								
13–15	826/1984	41.6	1158/1984	58.4	843/1954*	43.1	1111/1954	56.9
16–18	599/1494	40.1	898/1494	60.1	707/1481	47.7	774/1481	52.3
Sex								
Male	569/1448	39.3	879/1448	60.7	736/1426*	51.6	690/1426	48.4
Female	856/2033	42.1	1177/2033	57.9	814/2009	40.5	1195/2009	59.5
Place of residence								
Damascus	1078/2552*	42.2	1474/2552	57.8	1218/2510*	48.5	1292/2510	51.5
Surroundings	347/929	37.4	582/929	62.6	332/925	35.9	593/925	64.1
Perceived economic status of family								
Low	47/152*	30.9	105/152	69.1	72/148*	48.6	76/148	51.4
Moderate	840/1970	42.6	1130/1970	57.4	909/1949	46.6	1040/1949	53.4
Good	479/1217	39.4	738/1217	60.6	502/1199	41.9	697/1199	58.1
Earning money through work								
Yes	481/1226	9.2	745/1226	60.8	589/1224*	48.1	635/1224	51.9
No	886/2106	42.1	1220/2106	57.9	896/2073	43.2	1177/2073	56.8

[a]*Numbers of respondents are different due to missing answers for some items.*
[b]*Adequate = eating item ≥ 1 time daily, inadequate = eating item < 1 time daily.*
Statistically significant at P < 0.05; results from chi-squared test.

only 7% had a BMI > 25 and only 1% had a BMI > 30.

Students were asked about their own perceptions of their eating habits (Table 4). A large proportion considered that they consumed lots of tea and soft drinks. Also, more than a third of students admitted using too much salt on food. More than 50% said that they ate too much packaged food such as biscuits and chocolates. Some had consumed as much as 6 pieces per day. Snacking and eating outside the house were extremely prevalent among study subjects. When asked about the foods they usually ate for snacks, it varied from western type meals (pizza, for example) to traditional types such as legume-containing food (*falafel*), and meat-containing food (*shawerma, shish tawouk*). Snacks were taken inside restaurants or from take-away shops. Snacking did not differ significantly by age group or perceived economic status of the family.

When asked about sources of nutrition education, 33.1% of students indicated the family only as the best source of information; 6.4% indicated the school only and 5.1% indicated the media only. A total of 19.5% of adolescents indicated > 1 source.

Table 3 **Weight perception and management as reported by students**

Variable	Males		Females		Total		P value[a]
	No.	%	No.	%	No.	%	
Weight perception							
Very thin	8	0.6	10	0.5	18	0.5	< 0.001
Thin	280	19.6	323	16.1	603	17.6	
Appropriate	930	65.2	1269	63.3	2199	64.1	
Slightly overweight	207	14.5	401	20.0	608)	17.7	
Overweight	2	0.1	3	0.1	5	0.1	
Total	1427	100	2006	100	3433	100	
Plan to control weight							
Lose weight	279	19.8	817	41.1	1096	32.3	< 0.001
Gain weight	403	28.6	292	14.7	695	20.5	
No change planned	494	35.1	671	33.7	1165	34.3	
Not interested	231	16.4	209	10.5	440	13.0	
Total	1407	100	1989	100	3396	100	
Weight control during past month							
Yes	316	22.0	566	28.0	882	25.5	< 0.001
No	1118	78.0	1453	72.0	2571	74.5	
Total	1434	100	2019	100	3453	100	

[a]*P-values were derived using chi-squared test.*

Table 4 **Self reported dietary habits of in-school adolescents**

Dietary habit	Males		Females		Damascus city		Rural Damascus	
	No.	%	No.	%	No.	%	No.	%
Drinking a lot of tea	990/1455**	68.0	1018/2041	49.9	1475/2562	57.6	533/934	57.1
Drinking a lot of coffee	157/1449**	10.8	293/2035	14.4	337/2552	13.2	113/932	12.1
Drinking a lot of maté tea	328/1446**	22.7	285/2032	14.0	462/2546	18.1	151/932	16.2
Drinking a lot of soft drinks (not canned)	702/1447**	48.5	801/2033	39.4	1026/2551**	40.2	477/929	51.3
Eating a lot of packaged food	669/1422**	47.0	1185/2015	58.8	1332/2514	53.0	522/923	56.6
Using too much salt on food	532/1439	37.0	791/2029	58.5	943/2540*	37.1	380/928	40.9
Using too much pepper on food	352/1426	24.7	497/2019	24.6	596/2525*	23.6	253/920	27.5
Eating frequently outside the house	932/1382**	67.4	1074/1972	54.5	1479/2459	60.1	527/895	58.9

Missing data for some questions means that some values for total number of respondents are different.
Significant at P < 0.05.
***Significant at P < 0.01. Results from chi-squared test.*

Discussion

This study identified a number of eating habits practised by in-school adolescents in Damascus city and the surrounding areas that are potentially harmful and unhealthy [2]. Food consumption and other dietary behaviours are influenced by many factors. These include culture, agriculture, socio-economic factors and lifestyle. Our results are comparable with those of studies from neighbouring countries (A.M. Sibai, N. Kanaan, unpublished report, 1998) and western countries [9].

The study revealed that food consumption could be determined by economic factors such as fruit consumption as this is rather an expensive item on the market. Green vegetables, being a cheap item on the market, were consumed more by participants who reported low economic status of their families compared to more expensive items like fruit (Table 2).

Self-reported weight and height indicated that obesity and overweight were not prevalent among the study subjects. Nevertheless, Syrian adolescents did engage in weight control behaviours. Some of those who practised weight control measures, mainly females in this study, may be at risk of inadequate nutritional intake. Adolescents in particular can come under considerable pressure from the world at large to conform to current trends in fashion, body image, behaviour or foods. Recent developments in western dietary practices have tended to leave adolescents vulnerable to low intake of energy and of certain nutrients [10]. Studies of adolescents have noted the importance of psychosocial variables such as body image and self-perception in shaping dietary practices [11]. Nonetheless, our study revealed that nearly half the participants (46%) were not aware of their weight and height; this is another interesting finding that deserves note.

Snacking and light meal consumption was very common among study subjects. The food pattern was characterized by irregularity of meal consumption. Although snacks can be a source of needed nutrients, it is important that they do not substitute for regular meals. Snacking is an established eating pattern among adolescents worldwide. Snacking was more common in Nordic countries compared to southern European countries [12,13].

This study, like many others, has many limitations. First of all, using the food frequency questionnaire may be problematic. In spite of their inherent limitations, food frequency questionnaires have been used increasingly in research. Considerable research has been devoted to improving the validity and reproducibility of these questionnaires [14]. Secondly, our study has focused on in-school adolescents. Although secondary education is not universal in the country, a large proportion of adolescents attend schools. Additionally, our sample may have under-represented the rural areas. We embarked, for feasibility reasons, on sampling from schools close to Damascus city, within around 30 km of the city centre (the study was not intended to cover a national representative sample). In the cases where 9th and 12th grades were replaces by the grade below, we have no reason to think that this biased the results. Thirdly, self-administered questionnaires have some inherent problems and are subject to self-perceived measurements and reporting errors. But since our sample size was large, this should not affect the validity of the results very much, and the results compared well with similar studies. Further research is, however, needed to measure the nutritional status of Syrian adolescents objectively.

As far as is known, this study provided, for the first time in the country, data on the

dietary habits of Syrian adolescents. It highlighted, despite some limitations, the urgent need to intervene and to promote healthy eating behaviour among those youngsters. Schools can help young people improve their eating habits by implementing effective policies and educational programmes that reach families and the community at large [*15*]. Interventions at school have a great potential to work positively. A study from the United Kingdom suggested how difficult it is to achieve sustained dietary changes in the eating habits of secondary school children [*16*]. However, our study revealed that families might have an important role to play since a high propor-

tion of students felt their families would be a good source for nutrition education.

In conclusion, this study provided some baseline data for future research and for the use of policy makers. It also clearly supports the need for effective dietary education for adolescents, and even for children.

Acknowledgements

References

1. US Department of Health and Human Services. *The Surgeon General's report on nutrition and health.* Washington, DC, Public Health Service, 1988 (PHS publication no. 88-50210).

2. National Research Council. *Diet and health: Implications for reducing chronic disease risk.* Washington DC, National Academy Press, 1989.

3. Gregory J et al. *National diet and nutrition survey: young people aged 4-18 years. Vol. 1. Report of the diet and nutrition survey.* London, The Stationery Office, 2000.

4. Central Bureau of Statistics. *The statistical abstracts.* Damascus, 2000.

5. *The state of the world's children 2002: leadership.* Paris, UNICEF Publications, 2001.

6. Maziak W, Mzayek F. Characterization of the smoking habit among high school students in Syria. *European journal of epidemiology*, 2000, 16(12):1169–76.

7. *The behavioral risk factor surveillance system.* Atlanta, Centers for Disease Control and Prevention, 1999 (http://www.cdc.gov/nccdphp/dash/yrbs/survey99.htm, accessed 16 January 2001).

8. *Obesity: preventing and managing the global epidemic. Report of a WHO consultation on obesity, 3–5 June 1997.* Geneva, World Health Organization, 1997 (WHO/NUT/NCD/98.1).

9. Currie C et al. *Health and health behaviour among young people–health behaviour in school-aged children: A WHO cross-national study international report.* Copenhagen, Denmark, World Health Organization, 2000.

10. Bull NL. Dietary habits, food consumption, and nutrient intake during adolescence. *Journal of adolescent health*, 1992, 13(5):384–8.

11. O'Dea JA, Rawstorne PR. Male adolescents identify their weight gain practices;

reasons for desired weight gain, and sources of weight gain information. *Journal of the American Dietetic Association*, 2001, 101(1):105–7.

12. Cruz JA. Dietary habits and nutritional status in adolescents over Europe—southern Europe. *European journal of clinical nutrition*, 2000, 54(suppl. 1): S29–35.

13. Samuelson G. Dietary habits and nutritional status in adolescents over Europe. An overview of current studies in the Nordic countries. *European journal of clinical nutrition*, 2000, 54(suppl. 1): S21–8.

14. Fregapane G and Asensio-Garcia C. Dietary assessment of an educated young Spanish population using a self-administered meal-based food frequency questionnaire. *European journal of epidemiology*, 2000, 16:183–91.

15. *Guidelines for school and community health programs.* Atlanta, Centers for Disease Control and Prevention, (http://www.cdc.gov/nccdphp/dash/nutraag.htm, accessed in 15 June 2002)

16. Parker L, Fox A. The Peterborough schools nutrition project: a multiple intervention programme to improve school-based eating in secondary schools. *Public health and nutrition*, 2001, 4(6): 1221–28.

Regional training workshop to develop nutrition surveillance capabilities of Member States to improve the monitoring and evaluation capacities in nutrition programmes

The World Health Organization organized a training workshop in Alexandria, Egypt, from 7 to 15 March 2004 to develop the nutrition surveillance capabilities of Member States to improve the monitoring and evaluation capacities in nutrition programmes. The objectives of the workshop were: to prepare Member States to establish national nutrition surveillance systems with a focus on micronutrient deficiencies control and prevention which will enable Member States to monitor the iron and folate nutrition of their populations; and to develop a framework of national plans of action. Participants from Bahrain, Islamic Republic of Iran, Jordan, Kuwait, Morocco, Oman as well as representatives from the Centers for Disease Control and Prevention, Atlanta and UNICEF attended the workshop.