

## Selected dietary habits among female adolescents in Hail, Saudi Arabia

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### Abstract

**Objectives** To estimate, among Saudi teenagers, the prevalence of (1) insufficient fruit and vegetable consumption, (2) fast-food consumption, (3) cola-beverage consumption, and to classify respondents' body weight status using BMI.

**Methods** In November 2010, a school-based questionnaire was administered to 180 elementary female students in Hail, KSA (12-16 years). The questionnaire contained data about the intake of fruit, vegetable, fast-food and cola beverage. Anthropometric measurements of weight and height were also obtained. Data were analyzed using frequencies and descriptive statistics

**Results** The daily average of combined servings of fruits & vegetables was 1.65 (SD+1.01) servings. Most students (97.6%) did not eat the recommended amounts of fruits and vegetables. The total sample consumed 2.23 (SD+1.44) fast-food meals per week, and 9.99±8.25 cans of cola per week. The mean BMI was 23.5±5.28 kg/m<sup>2</sup>. The prevalence of overweight and obesity was 15.2% and 11.6% respectively.

**Conclusions** Unhealthy eating habits are common among Saudi female adolescents who tend to consume: less fruits, less vegetables, more fast-food, and more cola beverage. Additionally, the study showed that overweight and obesity were also common. Further studies are recommended to determine the psychosocial correlates of adopting healthy food habits among this segment of Saudi population.

**Key words:** *adolescence-dietary habits-BMI-Saudi Arabia.*

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## Introduction

The last few decades have witnessed an epidemiological shift in the causes of mortality and morbidity from infectious diseases to chronic non-infectious diseases amongst most Arab countries [1,2]. Among the modifiable risk factors in the development of chronic diseases is the dietary lifestyle. Dietary lifestyle in Arab countries has undergone "a nutrition transition" where fruits, vegetables, grains and fiber rich foods have been replaced by fatty, sugary and salty foods [1,2]. Although the phenomena of "nutrition transition" needs to be studied among different segments of the community, adolescence, a "coming of age", might be of a special concern. The importance of these teen years entails maintaining normal growth and establishing healthy eating habits [3-5]. Furthermore, adolescents' eating habits may have an enduring effect on their health [5]. It is believed that adolescence period of life is characterized by disordered eating habits that are inconsistent with nutritional recommendations [6].

In Saudi Arabia (SA), more than one third (38%) of the population is under 18 [7], which means that they are in their adolescence or on their way to be so. Common unhealthy eating habits among Arab adolescents include insufficient consumption of fruits & vegetables and excessive consumption of fast-food & cola beverages [3,4].

Although insufficient consumption of fruits and vegetables is a global phenomenon, it is more prevalent among developing countries [6]. Sufficient intake of fruits and vegetables has been revealed to protect from many serious chronic diseases including coronary heart disease, cancers, diabetes, hypertension and stroke [6]. The minimum acceptable intake of fruits and vegetables is five servings per day [8], with a standard portion size of 80 g [9].

With respect to fast-food consumption, the industry of fast-food has grown much lately in developing countries with a remarkable raise in the number of fast-food restaurants [10]. Frequent consumption of fast-food is harmful as it usually contains more fat and less fibers than ordinary food [11]. It was found that fast-food predisposes to chronic diseases such as cardiovascular diseases, diabetes and stroke [12,13,14].

Excessive consumption of cola beverages is associated with diabetes, metabolic syndrome, malnutrition, dental caries and disturbances in bone minerals that may end up with bone fractures [15,16]. Inappropriate intake of fruit, vegetable, fast-food and cola beverage contribute, directly or indirectly, to overweight and obesity through high caloric intake [13]. Overweight (including

obesity) is not uncommon among Saudi adolescent females. Previous local surveys reported that around 22%- 28% of Saudi girls were overweighted [17-19].

This study aims to investigate some essential dietary habits among female adolescents in Hail, SA. The objectives were to estimate the prevalence of insufficient fruit & vegetable consumption, to estimate the prevalence of fast-food consumption, to estimate the prevalence of cola beverage consumption and to classify respondents' body weight status using BMI.

## Methodology

**Procedure** In November 2010, a school-based study was conducted in Hail, SA. Ethical approval was obtained from the Ethics Committee of University of Hail. All elementary female students (first to third grades) were invited to participate in the study. The total number of enrolled students was 180. Data were collected using two tools: (1) A self-administered questionnaire (2) Anthropometric measurements of weight and height.

The researchers informed the students about the study and assured them about the confidentiality of their identities and responses. Additionally, students were informed that participation was voluntary. Each student completed her questionnaire independently, and then the researchers – aided by professional nurses- performed the measurement of students' height and weight and documented the results on student's questionnaire.

### Questionnaire

The questionnaire was principally based on WHO STEPS Instrument [20].

### Measures

#### 1. Questionnaire

##### Demographics:

**Age and grade.** Students indicate their age (continuous scores) and their school grade (1<sup>st</sup> elementary=1, 2<sup>nd</sup> elementary=2, 3<sup>rd</sup> elementary=3).

**Residency.** Students indicated whether they live in urban or rural areas (urban=1, rural=2).

**Parents' level of education.** Students rated on a seven-point scale the level of their father's and mother's education (no formal schooling =1, less than primary school =2, primary school completed

=3, secondary school completed =4, high school completed =5, college/university completed =6, post graduate degree =6) [20].

*Parents' employment status.* Students were asked to specify the employment status of their mother and father (employed=1, unemployed=2).

*Consumption of Fruit and Vegetables.* Assessment of fruit and vegetable consumptions were based on WHO STEPS Instrument [20]. This instrument had been translated into Arabic language and trial-tested in SA in a previous local survey [21]. Based on 4 separate items, students indicated how many days per week they consume fruits & vegetables and how many servings of fruits & vegetables they consume per day (continuous). Before proceeding to answers, students were advised to see an enclosed appendix that included: (a) colorful pictures of common fruits and vegetables in SA (b) clarification for what accounts for a standard portion size.

*Consumption of fast-food.* Students indicated how many times per week they obtain food from fast-food places (continuous). A list containing the names of popular fast-food in SA was added as a reminder to participants.

*Consumption of cola beverages.* Students indicated how many cans of cola they drink weekly and quantity of cans of cola consumed per day (continuous).

## 2. Anthropometric measurements

Students' height (in meters) and weight (in kilograms) were measured. Body mass index (BMI) was calculated according to this formula:  $(\text{BMI} = \text{Weight} / \text{Height}^2)$ . Overweight and obesity were determined according to BMI reference percentiles for normal SA children and adolescents [22]. Participants were classified overweighted when their BMI fall between the 85<sup>th</sup> & 94<sup>th</sup> percentile. Those who positioned at 95<sup>th</sup> percentile or higher were considered obese [23].

Data were analyzed using the SPSS software program (version 17.0). Frequencies and descriptive statistics were used to describe the characteristics of the sample population. Daily/weekly dietary habits and BMI were assessed using means and SD.

## Statistical analyses

Data were analyzed using the SPSS software program (version 17.0). Frequencies and descriptive statistics were used to describe the characteristics of the sample population. Daily/weekly dietary habits and BMI were assessed using means and SD.

## Results

### Characteristics of the sample

Students' response rate was 100%. Nine questionnaires were excluded from further analysis due to missing data. The mean age was 13.77 years (SD=1.25). The distribution of students according to their grade was as follows: 7<sup>th</sup> grade 32.9%, 8<sup>th</sup> grade 36.6% and 9<sup>th</sup> grade 30.4%. Around 60% of students were living in rural areas. Illiteracy rates among students' fathers and mothers were 7.5% to 21.6% respectively. Demographic characteristics are shown in table 1.

**Table 1. The demographic characteristics of the sample population**

Characteristic	Number (n = 171)	Percentage (%)
<b>Grade</b>		
- 7 <sup>th</sup>	55	33.5%
- 8 <sup>th</sup>	58	35.4%
- 9 <sup>th</sup>	51	31.1%
<b>Residency</b>		
- Urban	66	40.2%
- Rural Areas	98	59.8%
<b>Father education</b>		
- No formal schooling	12	7.5%
- Less than primary school	40	25%
- Primary school completed	16	10%
- Secondary school completed	10	6.3%
- High school completed	29	18.1%
- College/university completed	34	21.3%
- Post graduate degree	19	11.9%
<b>Mother education</b>		
- No formal schooling	35	21.6%
- Less than primary school	47	29.0%
- Primary school completed	20	12.3%
- Secondary school completed	18	11.1%
- High school completed	16	9.9%
- College/university completed	21	13.0%
- Post graduate degree	5	3.1%
<b>Father employment</b>		
- Employed	129	81.1%
- Unemployed	30	18.9%
<b>Mother employment</b>		
- Employed	42	25.9%
- Unemployed	120	74.1%

### *Consumption of Fruit and Vegetables*

As shown in table 2, the total sample consumed fruits and vegetables in 4.47 (SD=2.06) and 4.15 (SD=2.03) days per week respectively. The mean daily number of consumed servings of fruits and

vegetables was 1.29 (SD=0.55) and 1.20 (SD=0.47) respectively. The daily average of combined servings of fruits and vegetables was 1.65 (SD=1.01) servings. Only 2.4% of students consumed the daily recommended amount of fruits and vegetables (i.e. 5 servings/day).

#### *Consumption of fast-food*

Students consumed fast-food in 2.15 (SD=1.44) days per week with daily consumption of 1.05 (SD=0.23) meals. On average, the total sample consumed 2.30 (SD=1.60) meals of fast-food per week. Around one fourth of the sample (26.2%) consumed 3 meals or more of fast-food per week.

#### *Consumption of cola beverages*

The total sample consumed cola in 5.30 (SD=2.43) days per week with the mean daily consumption being 1.59 (SD=1.18) cans. On average, the total sample consumed 9.99 (SD=8.25) cans of cola per week. Around half of the sample (53%) consumed 7 cans or more of cola per week.

**Table 2. Descriptive statistics for variables measured in the study**

Variable	Mean	SD
No. of days fruits consumed per week	4.47	2.06
No. of servings of fruits consumed per day	1.29	0.55
No. of days vegetables consumed per week	4.15	2.03
No. of servings of vegetables consumed per day	1.20	0.47
No. of days Fast-food consumed per week	2.15	1.44
No. of times Fast-food consumed per day	1.05	0.23
No. of days cola consumed per week	5.30	2.43
No. of cans of cola consumed per day	1.59	1.18
Weight in Kg	51.12	12.41
Height in Cm	147.71	7.48
BMI	23.50	5.28

#### *Anthropometric measurements: BMI*

The mean weight and height were 51.12 (SD=12.41) kg and 147.71 (SD=7.48) cm respectively. The mean BMI was 23.50 (SD=5.28). A total of 26.8% of the girls were overweighted, among which 11.6% were obese.

## Discussion

This study assessed some selected unhealthy food habits among Saudi female teenagers. The first objective of the study was to estimate the prevalence of insufficient fruit and vegetable consumption. Remarkably, most of the sample (97.6%) consumed insufficient amounts of fruits and vegetables, with the daily average of combined servings of fruits and vegetables being 1.65 servings. Previous studies among Arab adolescents also revealed low intake of fruits and vegetables. For example, Washi and Ageib [4] found that around 3/4 of the sample did not consume fruits and vegetables on a daily basis. Additionally, a study conducted by Haddad et al. [3] showed that around half of the sample consumed fruits and vegetables only once per day.

The second objective was to describe the prevalence of fast food and cola beverage consumption. On average, the total sample consumed 2.30 (SD=1.60) meals of fast food per week. Around one fourth of the sample (26.2%) consumed 3 meals or more of fast food per week. More frequent consumption of fast-food has been reported by previous Arab studies which showed that 53% [3] and 22% [4] of adolescents consumed fast-food on daily basis. These variations might be attributed to the differences in the level of urbanization. Actually, there is no definite agreement about what accounts for high rates of fast-food consumption. Bauer et al. [24] described fast-food consumption to be frequent when it is three times or more per week. .

With respect to cola consumption, the total sample consumed 9.99 (SD=8.25) cans of cola per week, and around half of the sample (53%) consumed 7 cans or more per week. Similarly, a previous Arab study, which encompassed female adolescents, showed that 55% of the sample consumed one can or more of cola per day [25].

The last objective was to classify respondents' body weight status based on BMI reference percentiles for normal Saudi children and adolescents. Results showed that around one fourth of the sample (26.8) was overweighted, while 11.6% were obese, which falls in line with some available studies [17-19].

## Conclusions

This study showed that unhealthy eating habits are common among Saudi adolescents who tend to consume less fruits & vegetables and more fast-food & cola beverage. Additionally, the study revealed that overweight and obesity were common. Accordingly, there is a need for interventions that promote healthy dietary habits. Further studies are recommended to determine the psychosocial factors associated with adolescents' dietary habits.

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