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The effect of parents' nutritional knowledge and attitudes on their children's eating habits

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Summary. The aim of this study was to explore the effect of parents' nutritional knowledge and attitudes on their children's eating habits. Nutritional knowledge and dietary behavior of Kuwait University undergraduate students and their parents were evaluated using paper-based questionnaires to assess lifestyle and nutrition behavioral changes. A total sample of 700 female and male students was recruited for the study. A week positive relationship was found between parents' nutritional knowledge and children's eating habits (r=0.229). The findings suggest that parents' nutritional knowledge can slightly assist in adopting healthier eating habits in children, which may reduce nutrition-related diseases. However, future studies should emphasize on exploring other factors affecting dietary behavior such as taste, availability, food cost or security, cultural or religious beliefs and perceptions about food and health.

Key words: Nutritional Knowledge; parents; dietary behaviours; adolescents

Introduction

Assessments of the WHO reveal that non-communicable diseases will be the leading cause of about 75% of total death in the developed world by 2020. Nowadays, adopting an unhealthy lifestyle and diet, which may lead to the development of obesity, could be the main health problem (1, 2). An estimation of 80% of existing chronic diseases is mainly due to dietary and lifestyle factors according to the World Health Organization (3). Consequently, obesity, diabetes, hypertension, cardiovascular diseases and some types of cancer, are attributable to unhealthy and inadequate diet, eating behaviors, and insufficient physical activity, especially if adopted during early adulthood (4, 5). The nutritional transition, in which westernized diet is substituting healthy eating patterns, has increased the diet-related disease burden mostly among university students (4). Based on the reports of the Behavioral Risk Factor Surveillance System (BRFSS; 1991-1998), young adults between the ages of 18 and 29 have the highest increases in obesity (5).

Lifestyle has been recognized to be the main factor in sustaining health and preventing non-communicable diseases. The primary reasons for changing one's lifestyle are the dietary patterns of individuals (1, 2).

One study conducted by Demosthenes et al. indicated and that dietary patterns rich in whole grains, legumes, fruits, vegetables, and fish had significant effects in reducing the unfavorable symptoms of metabolic syndrome, whereas, dietary patterns characterized by high intake of alcohol and meat increased these indicators (6). Another study conducted in Iran by Epuru et al. showed similar results, in which healthy eating patterns defined by high consumption of fruits, vegetables, fish, dried fruits and low fat dairy products, were accompanied with lower levels of systolic blood pressure, while western patterns which comprise foods rich in meat, fat, and sweets were related to higher triglyceride, fasting blood sugar and insulin concentrations (7).

Much work has been done to explore the link between the traditional Mediterranean diet pattern and adiposity (8, 9). One research conducted in Lebanon by Al-Isa et al. supports a protective effect of the

Mediterranean diet on adiposity and weight gain (8). Furthermore, evidence from epidemiological studies correlates this dietary pattern to decreased incidence of type 2 diabetes, coronary diseases, and cancer, as well as to increased life expectancy (9).

In Kuwait, obesity and type II diabetes prevalence is continuously increasing. The obesity rate in adults has reached 36% for men and 38% for women, while the overweight rate in adults has reached 74% for men and 77% for women (8). Also in Kuwait, as per the 2017 statistics, diabetes prevalence in adults has reached 15.1% (10). Studies have proposed that improved dietary patterns can, even with merely minimal weight loss, prevent or assist in controlling a number of costly, chronic conditions like hypertension, cardiovascular disease, diabetes, and even some types of cancer (11).

The period of emerging adulthood, which is defined as the period of 18-25 years of age, and mostly spent at colleges or universities, is being understudied, as the incidence of unhealthy dietary patterns and physical activity practices increases, and therefore prevalence of obesity increases in this life period (12, 13).

College is a crucial life period as various lifestyle behaviors are shaped and may continue throughout life (5, 14). Researchers have observed that dietary habits worsen during college age, leading to an increased risk of chronic diseases as they grow older (15, 16). In their reports titled "Nutritional Prevention Strategy/ Health Eating" and "The Surgeon General's Vision for a Healthy and Fit Nation", the U.S. Surgeon General highlighted colleges and schools as locations for spreading knowledge and teaching students about nutrition to assist them in applying the "Dietary Guidelines for Americans" recommendations to lessen the coronary diseases risk (17).

Available evidence suggests that majority of college students might not follow the dietary and physical activity guidelines intended to minimize the risks associated with non-communicable diseases. A typical dietary intake of a college student could be characterized by low consumption of fruits and vegetables and high intake of fast, junk and convenience foods containing fat, sodium and sugar, along with frequent intake of calorie-dense snacks (2, 14, 15, 16). As discussed earlier, unhealthy eating habits in the period of

emerging adulthood have been associated with a number of long-lasting critical health consequences such as osteoporosis, obesity, hyperlipidemia, and diabetes (16). A Greek study concluded that college students had a considerably increased intake of saturated and total fat and a lower intake of polyunsaturated and monounsaturated fat, folate, vitamin E and fiber (18). Another study by Butler et al. stated that female students in a university located in the Midwest of USA had a significantly increased daily fat consumption as well as a significantly decreased intake of bread and vegetables in their first year of college (19). Another study by Morse and Driskell has described the college students' consumption of fast food as a lifestyle due to convenience, taste, cost, social environment and location (15, 20). A review of college students' physical activity indicated that a limited percentage of students (35%) exercise on a regular basis with an increased rate for males (40%) vs. females (32%) (21). College-aged students are deemed to be the most susceptible age group to gain weight. It is reported that American first-year college students gain approximately 1 to 3 kg of weight (22).

Investigators revealed that fast food consumption is positively correlated with weight gain in the long-term. Evidence from The 1994-1996, 1998 continuing Survey of Food Intakes by Individuals (CSFII) suggested that young adults aged between 20-39 years have the highest fast food consumption among different age groups. Moreover, these findings showed that 52% of young adults ate fast food on one or both days of that survey since dietary data were collected via 24-hour dietary recalls in two nonconsecutive days (23). In a similar vein, these data concluded that young adults (19-39 years old) occupy first place in soft drink intake (24). Racette and colleagues stated in their study that more than 50% of college students ate at high-fat fast food restaurants at least thrice a week (25), whereas, Niemeier et al. found that fast food restaurants use and breakfast skipping increased dramatically throughout the period of adulthood transition (26). A recent Australian report discovered the prevalence of convenience meal consumption and its relationship with diet quality. It assumed that convenience meals were consumed as a main meal at least once per week by 30% of the students. In addition, it showed a substantial diet quality as

a result of commercially prepared meal intake (27).

Despite the WHO, United Kingdom, and Canada's dietary guidelines to consume at least five to seven portions of fruits and vegetables daily, it has been demonstrated that college students failed to meet their fruit and vegetable requirements, and their daily consumption varied between 2.2 and 2.8 portions every day (28, 29, 30). Likewise, Dodd et al. concluded that 66% of university students eat less than the five servings of fruits and vegetables per day (31). In their fruit and vegetable consumption study, Silliman and colleagues reported that fruit and vegetable intake was less than 1 serving a day in 64% and 58% of the students respectively, and those who consumed vegetables twice or thrice a day were only 14% of the total study population. As for fruit intake, it was observed that 25% of female and 11% of male students consumed fruits twice or thrice a day (32). In the Kingdom of Saudi Arabia (KSA), only 17.2% of female university students adhered to the fruit and vegetable intake recommendations (33). Additionally, evidence from recent Saudi study in Al-Hasaindicated concluded that 78% of female university students did not consume at least 5 servings of fruits and vegetables (34). Likewise, in another study done in Hail University in KSA, Epuru et al. revealed that more than 70% of female students were not following WHO recommendations (7). Findings from other Gulf countries showed parallel results. For example, it was noted that approximately 25% of Bahraini students consumed the recommended daily amount of fruits and vegetables (35). Al-Rethaiaa et al. summarized the dietary behaviors of 357 male students aged 18-24 years from College of Health Sciences at Rass, Qassim University. These included low fruit and vegetable consumption, frequent snacking, high intake of fried food, and having two meals per day (36). In spite of the dietary recommendations that energy coming from solid fat and added sugars should only constitute 20% of total daily energy, it has been found that consumption of such foods by men aged between 19 and 30 represented 42% (37).

In a pilot study implemented at Kuwait University to report food habits of nutrition students, it was determined that about 87% of students did not adhere to the WHO recommendations. On the one hand, their intake of sweets, fast food, soft drinks and fatty foods was high. On the other hand, their consumption of vegetables, healthy fats and water was low. A small percentage of students met their fruit requirements (38).

Parents have an imminent responsibility in shaping their children's eating habits and preferences by acting as role models. Children's attitudes and dietary behaviors rely heavily on what type of foods their parents allow into the household (39, 40). Enhancing children's nutritional status is highly dependent on the level of their parent's dietary knowledge. A researcher observed that Ethiopian mothers do not provide vegetables to their infants because they assumed that it may cause stomach illnesses and indigestion. Another study found that Ethiopian mothers did not feed their toddlers any animal-origin foods believing that their bodies were not able to process such foods. Accordingly, parents could restrict certain types of food from their children once it's perceived as being harmful (41).

A number of elements may influence a mother's dietary behaviors including socioeconomic status, educational level, age, working position and level of nutritional knowledge. A vast amount of research shows that the child's nutritional status is positively correlated with the mother's nutritional knowledge level. Mothers who had a higher level of nutritional knowledge provided their children with healthier food such as vegetables, fruits, legumes and restricted them from having unhealthy food options such as soft drinks, fast food, food containing artificial flavors and colors (40).

Evidence from an Omani study indicated a positive correlation between children's eating habits scores and the mothers' nutritional knowledge scores (42). Another study conducted in the late nineties, which discussed the effect of mothers' knowledge and children's dietary behavior found that intakes of total and saturated fat, cholesterol, and sodium in preschool children were negatively associated with maternal knowledge (43). Previous reports also suggest that children diets are associated with their parents' food (21, 32). Beydoun et al. discovered a moderate positive association between parents and children dietary intake, with higher associations for younger children (44). Weak to moderate associations of parent-child dietary or nutrient intakes have been found in other studies (21, 32). Still, researchers have still not come

to a conclusion as to whether these findings are applicable for overweight/obese mothers and their children. Additionally, researchers assumed that socioeconomic status might influence parent-child food choices and availability (45).

Understanding the parents-child relationship in lifestyle-related risk factors of overweight and obesity among Kuwaiti adolescents is crucial for devising public health policies and effective strategies to prevent and treat childhood obesity. Despite these major considerations, there have been no systematic studies among Kuwaiti adolescent children to characterize their eating habits, and their parents' nutritional knowledge and attitude simultaneously. Therefore, the objective of this study is to investigate the effect of parents' nutritional knowledge and attitudes on their children's eating habits

Methods

Sampling

Kuwait University undergraduate students of both sexes attending different colleges of all majors (n= 16) with a mean age of≈21years were recruited for this study [no. of subjects 700 individuals (87% females and 13% males), equal to 1.9% of the entire population (37,000students)]. The population of Kuwait University is equal to 0.93% of Kuwait population (4 million) (Kuwait University, 2017) and (Kuwait Central Statistical Bureau). Students were informed of the study and some of them were recruited to participate through a series of announcements that were made before or at the end of usual lecture times. Students were selected from classrooms in agreement with professors, cafeterias, lounges, campus squares, and lobbies. Participation was voluntary and anonymous. All students were surveyed over four months, from October to the end of February 2017. A consent form and an information sheet about the purpose of the study were included in the questionnaire. Students represented both theoretical (non-science) and practical (science) colleges. From a total of seven hundred questionnaires, six hundred and ninety were returned; males (n= 87) and females (n= 603). The response rate was 98.6%, since 1.4% of the students either filled out the questionnaire

incorrectly or left more than half of the questionnaire incomplete; therefore, they were excluded from the sample.

Eligibility Criteria

Undergraduate Kuwaiti and non-Kuwaiti students of both sexes aged 17 years and older with children or not, were included in the study. Graduate and pregnant students, as well as college personnel were excluded from the study.

Data Collection
Questionnaire

We used a dietary questionnaire established earlier and tested regarding its reliability (46) as well as confirmed for content validity by two professors in the Food Science and Nutrition Department, and it was self-administered during college time. We obtained the written consent from Giovanna Turconi, the author of this questionnaire, to use it in our study. All questions of the questionnaire were translated into Arabic in order to make it easier for students to respond. Some questions, especially in Section 3 (eating habits) of the questionnaire were localized to meet Kuwaiti culture and remove ambiguity of untraditional cuisines, while some of them were omitted, as they are culturally and religiously unacceptable. These questions were about drinking wine and beer at meals, and eating alcohol-containing foods. The questionnaire included nine main sections.

Section 1- Socio-demographics, contained information on personal data and socio-demographics and were collected by means of ten questions. The socio-demographic section covered questions about age, gender, nationality (Kuwaiti and non-Kuwaiti), residential area, social status, year and college of study. Anthropometric measurements including students' weight and height were also collected. These measurements were self-reported by the students. The BMI cut-off points used were based on the National Institute of Health guidelines, which classified students' weight status into four categories: underweight (BMI ≤ 18.5), normal weight (BMI between 18.5 − 24.9), overweight (BMI between 25–29.9), and obese (BMI ≥ 30) (USDDH, NHLBI, 2003). Data about family monthly income was collected and divided into three categories low

(<1,000 KD), medium (1,000–3,000 KD), and high (>3,000 KD). The other sections contained 90 items overall. Appendix 1 contains the questionnaire, which consists of the various topics described below.

Section 2- Food frequency questionnaire, contained 19 questions and has been validated for use in the Kuwaiti population. The aim of this section was to discover students' daily average, frequency of consumption of typical food and beverages such as bread, rice, cereal products, fruits and vegetables, milk, tea, coffee and weekly consumption of other foods such as meat and meat products, fish, eggs, cheese, legumes, etc. Visual aids about the quantities of food items were included in the questionnaire in order to help students predict their portion sizes.

Section 3 - Eating habits questionnaire, consisted of 13 questions. This section was designated to explore the food habits of college students, particularly students with regard to breakfast contents, the number of meals per day, daily fruit and vegetable intake, as well as the consumption of both soft and energy beverages. Seven questions under this section had the following response categories: always, often, sometimes, never; whereas the other six had four categorical responses to assess eating habits. A 0 to 3 score range was assigned to each answer, with the highest score given to the healthiest response and the minimum score to the least healthy response. The total score of this section was 39.

Section 4 - Nutritional knowledge: contained 10 questions; each question had four answers out of which one is correct. Corrects answers were given 1 score, whereas, the incorrect answers were given 0 score. The purpose of this section was to assess the student's nutritional knowledge from different aspects. The total score of this section was 10.

Section 5- Reflection of parents' nutritional knowledge on child's nutrition: This section was added to the dietary questionnaire of Turconi. We used a previously constructed questionnaire (40). It contained 20 questions, which had the following response categories: always, often, sometimes, never. This section was completed only by students who have children and aimed at exploring the impact of parents' nutritional knowledge on their children's eating habits. The score ranged from 0 to 3; with the maximum score assigned

to the healthiest one and the minimum score to the least healthy one. The total score of this section was 60.

The total score of each section was divided into tertiles, with the lowest tertile assigned to the worst assessment category and the highest to the best assessment category. Before distributing the questionnaire, we explained the aim of the research to the students and asked for permission to participate in this study. In order to decrease the probability of bias, the dietitian or the observer who supervised the questionnaire was well instructed on the process and was guided to give a standardized explanations in case any of the students' had questions; without providing any answers to the questionnaire items. The questionnaire was self-administered which enabled the gathering of a relatively larger set of data from different locations simultaneously in a cost effective manner as compared to personal interviews. On the other hand, a self-administered questionnaire makes it more challenging to validate response truthfulness (47).

Data Analysis

Data of all questionnaire items were entered manually and were analyzed using a Statistical Package for Social Sciences (SPSS), version 22. The scores obtained in each section were expressed as mean ± standard deviation. The percentage distribution of students in each tertile score was also calculated by using SPSS. Student-t test was calculated to investigate differences in scores obtained by males and females, normal and overweight plus obese subjects. Pearson-Product Moment correlation coefficients were computed to analyze the relationship between BMI and the investigated variables and between various questionnaire sections to test our hypotheses. In addition, Chi-Square test was calculated for the relationship between children's dietary behaviors and their parents' nutritional knowledge.

Reference Standards

According to guidelines stated by the National Institute of Health, weight status is classified into four categories: underweight (BMI ≤ 18.5), normal weight (BMI between 18.5 − 24.9), overweight (BMI between 25–29.9), and obese (BMI ≥ 30)(USDDH, NHLBI, 2003).

Results and Discussion

Characteristics of the sample are presented in Table 1. Most of the respondents were women (87.4%). The age of students ranged from 18 to 37 years with statistically significant gender differences. Males mean age was 21.7 ± 3.1 years while 20.7 ± 2.5 years for females. The majority of students were Kuwaitis (80.7%), while non-Kuwaitis represented 19.3% of the sample. Table 2 reports the demographic characteristics of college students who participated in this study. Most of the students were seniors (45.4%), while juniors, sophomores, and freshman represented 22.2%, 21.1% and 11.3% of the sample, respectively. More than half of the students (54.3%) studied at practical colleges (e.g., engineering, pharmacy, science, etc.), while 26.1% studied at theoretical colleges (e.g., arts, commerce, law, etc.) and 19.6% were not specialized. Geographically, Kuwait consists of six governorates, where some of them are defined as urban and others as semi-urban. In our study, more than one half (64.6%) of the sample live in urban areas. About 17.7% belonged to families with high monthly income (+3,000KD). In addition, BMI mean value was 27.1 ± 10 kg/m2 for males and 24.2 ± 5.2 kg/m2 for females, with statistically significant differences between both genders (p= 0.000). According to the guidelines of the National Institute of Health cut-off points' reference standard for BMI (48), 2.3% of males and 5.8% of females were underweight, 23% of males and 23.4% of females were overweight, and 20.7% of males and 10.6% of females were obese. The age distrubution for obese students was slightly higher for both males and fesmales as compared to the age distribution for normal weight males and females. Only 6.2% of our sample had children.

According to the BMI of students, the high prevalence of overweight was almost the same in both sexes, while the prevalence of obesity was two times higher in males than females. These results are consistent with the finding of Al-Isa et al. who revealed that the prevalence of obesity among Kuwaiti college students is higher in males than females (8). However, most of the college students were in the normal range of values according to guidelines of the National Institute of Health (48).

Food Frequency of Food Intake

Table 3 presents students' responses to food frequency intake of favorable food types. Results indicate that approximately two-thirds of students reported

Table 1. Sample Characteristics

Variables	Males (n=87)	Females (n=603)
Age (years)	21.7 ± 3.1	20.7 ± 2.5
Weight (Kg)	82.9 ± 32.1	61.5 ± 14
Height (m)	1.7 ± 0.07	1.6 ± 0.06
BMI (kg/m2)	27.1 ± 10	24.2 ± 5.2
Underweight subjects' BMI (kg/m2)	18.2 ± 0.3 (2.3%)a	17.4 ± 0.8 (5.8%)a
Overweight subjects' BMI (kg/m2)	27.04 ± 1.4 (23%)a	27 ± 1.4 (23.4%)a
Obese subjects' BMI (kg/m2)	40.6 ± 15.2 (20.7%)a	35.1 ± 6.3 (10.6%)a

aBetween parentheses, percentages of subjects

Table 2. Demographics of the sample (n=690)

Variable	Frequency (N=690)	Percent
Gender		
Male	87	12.6
Female	603	87.4
Nationality		
Kuwaiti	557	80.7
Non-Kuwaiti	133	19.3
Year in College		
Freshmen	78	11.3
Sophomore	146	21.1
Junior	153	22.2
Senior	313	45.4
Area of Residency		
Urban	446	64.6
Semi-urban	244	35.4
College of Major		
Practical colleges	375	54.3
Theoretical colleges	180	26.1
Not-specialized	135	19.6
Social-Status		
Single	593	86
Married	92	13.3
Divorced	5	0.7
Having Children		
Yes	44	6.4
No	646	93.6
Income		
Low	3	0.4
Medium	565	81.9
High	122	17.7

daily consumption of milk and about 82% of them specified drinking one to two glasses of milk per day. However, more males (10%) than females (3.4%) reported intake of at least four cups of milk/yogurt per day. Students consumed rice, pasta, bread, and potatoes regularly, as 67% of the students reported intake of one to two portions daily. Less than half of the sample (44%) reported daily intake of fruits and vegetables and about one-quarter reported eating two to three portions daily. The percentage of fruit and vegetable consumption for both males and females was too close, with a slightly higher proportion for male students (45% vs. 44%, respectively). In a similar vein, 13% of male students reported daily intake of meat compared to 10% of females. More than one-third of the students (33% vs. 35% respectively) reported fish intake once every 15 days and eggs one to two times per week. However, the percentage of males (45%) consuming fish one to two times per week was higher than females (35%). Cheese was consumed in similar proportions by males (22%) and females (21.5%). About one-quarter of the students (23%) reported intake of ready-to-eat meat (such as mortadella and sausages) once every 15 days. Approximate proportion (22%, 25%, respectively) reported intake of cakes/sweets and pizzas at least one to two times weekly. More than one-third of the sample (40%, 38%, 35%, respectively) consumed legumes, fried potatoes, and fast food at least one to two times per week. Consumption of ready-to-eat meat was more frequent among males (30%) than females (15%), whereas sweets consumption was more frequent among females (25%) than males (18%). Males (39%) consumed fast food more frequently than females (35%), although the percentages are close to each other.

Table 3: Percentage distribution of subjects' food frequency

Variable	Yes			No				
1- Do you drink milk/milk and coffee/ cappuccino or do you eat yogurt every day?	64.2			35.8				
	1-2/day	3-4/day	>4/day	1-2 /week	3-4 /week	>4 /week	1/10-15days	Never
	82	13.7	4.3	43.7	28.3	5.3	10.9	11.7
2-Do you eat pasta/rice/bread/ potatoes every day?	81.4			18.6				
	1-2/day	3-4/day	>4/day	1-2 /week	3-4 /week	>4 /week	1/10-15days	Never
	67.3	25.4	7.3	31.1	50.8	12.1	5.3	0.8
3- Do you eat fruit and vegetable every day?	43.8			56.2				
	1-2/day	3-4/day	>4/day	1-2 /week	3-4 /week	>4 /week	1/10-15days	Never
	70.6	23.8	5.6	43	35	10.7	6.6	4.7

Times of food intake

Variable	1-2	3-4	1/day	2/day	1/10-15days	Never
4- How often do you eat meat in 1 week?	29	31.9	22	4.8	6.2	6.1
5- How often do you eat fish in 1 week?	36.4	4.4	0.7	0.6	32.8	25.1
6- How often do you eat eggs in 1 week?	34.5	23.9	10.4	1.6	19.4	10
7- How often do you eat cheese in 1 week?	21.6	37	24.7	6.1	6.7	3.9
8- How often do you eat mortadella and sausages (ready to eat meat) in week?	17.1	5.1	2.3	1.3	22.6	51.6
9- How often do you eat legumes in 1 week?	38.9	19	6	1.2	21.2	13.8
10- How often do you eat sweets and cakes in 1 week?	24.2	29.8	26.6	10.9	6.5	2
11- How often do you eat fried potatoes in 1 week?	37.3	25.7	9.3	2.6	19.2	6
12- How often do you eat in a fast food in 1 week?	35.3	17.4	7	1.7	27.7	10.9
13- How often do you eat pizza in 1 week?	25.5	4.6	1.3	0.6	53.1	17.9

Eating Habits

The total score for this section (39) was divided into tertiles, where the lowest one referred to "inadequate eating habits", the medium one referred to "partially satisfactory eating habits" and the highest one referred to "satisfactory eating habits". The mean score for this section was 23.3 ± 4.9, without any statistical significant difference between males and females (p = 0.277) (Figure 2). The scores of eating habits section did not differ significantly between seniors, juniors, sophomores, and freshmen (p = 0.328), as well as between students' with high, medium and low household income (p = 0.781). Approximately, 2.6% of the students showed "inadequate eating habits", 71.4% had "partially satisfactory eating habits", while more than one-quarter of the sample (26%) showed "satisfactory eating habits". The most health adverse eating habit noted was eating calorie-dense breakfast. Approximately, 41% of the sample reported having fat-dense breakfast, which mainly consisted of pastries, 27.7% reported consuming breakfast rich in whole grains, while only 7.5% reported eating fruits for breakfast. Overall, students' eating habits were poor in fruit and vegetable intake. Only 8.1% and 13.8% of the subjects reported eating at least two portions of fruits and vegetables respectively, on a daily basis. About 16.8% of the sample reported consuming high amounts of soft drinks.

Data on eating habits revealed that the worst eating habit is eating calorie-dense, high fat breakfast, which makes up 41% of the sample. In addition, data showed that most students' should increase their intake of fruits and vegetables, and decrease their intake of soft drinks and calorie-dense snacks. Furthermore, findings suggest that eating three meals a day should be encouraged since only 22% of the sample consume three meals daily. Frequent eating has been considered one of the common dietary approaches for managing body weight (49), based on the concept that eating frequent meals has led to increased satiety, and decreased hunger and food intake (50, 51, 52). Our findings are inconsistent with the official food-based dietary guidelines for Kuwait (53). One good dietary habit that was practiced by the majority of students was favoring water over carbonated and energy drinks. Besides, about 64% of students reported having a daily breakfast regularly or usually. Our findings are consistent with the findings of a Lebanese study, which showed that 53% of students ate their breakfast daily (54). Nonetheless, there was a gender variance in terms of daily breakfast consumption. Generally, males were found to have breakfast more frequently than females. Available evidence suggests that breakfast consumption plays a role in reducing intake of dietary fat as well as minimizing impulsive snacking (54, 55). No gender differences were found between males and females regarding milk/yogurt consumption (at breakfast). Daily milk/yogurt was consumed by approximately 64% of the students. Out of those who consumed milk/yogurt daily, about half of the students consumed one to two glasses of milk per day. Findings suggest that excess weight gain can be avoided by consuming calcium-rich dairy products, particularly if intake was in sufficient amounts (three or more servings per day) and accompanied with energy balance (9). Results suggest that males experience better daily fruit consumption, whereas vegetable consumption was of similar proportions in both genders. However, about 6% of the students met the recommendation of consuming at least five servings of fruits and vegetables per day (53). Our data reveal that males' consumption was higher than females with regards to red meat, fast food and soft drinks, which may cause excessive body fat, weight gain and obesity (11, 56). Another study conducted on an African tribe found that food preferences are influenced by gender, with males favoring red meat (18). The high percentage of obese males may be explained by these dietary behaviors. Researchers concluded that the high glycemic index of sweetened beverages increases blood insulin, which may cause insulin resistance and finally obesity (Bachman et al., 2006). It was hypothesized that female students would score better in both eating habits than male students. However, our results showed that males had insignificant higher eating habits scores than females. Our results are consistent with one Korean study which found that women's dietary habits were not healthier than their male counterparts, although they scored higher in the nutritional knowledge test (p<0.01) (57).

Nutritional Knowledge

The total score for this section (10) was divided into tertiles, where the lowest one referred to "insufficient nutritional knowledge", the medium one referred

to "good nutritional knowledge" and the highest one referred to "quite good nutritional knowledge". The mean score for this section was 5.7±2 with a statistically significant difference between males (4.8 ± 2.2) and females (5.8 ± 2) (p= 0.000). Approximately 62% had good nutritional knowledge (most female parents), and only17.1% of the parents had insufficient nutritional knowledge (30% of total males vs. 15% of total females). Less than one-quarter of the parents (20.9%) had quite good nutritional knowledge (higher among females). The most common incorrect answers were related to dietary fiber, food protein content and energetic values. The most frequent mistake was to the question "which is the nutrient that contains the most energy?". In response to this question, only 18.8% answered correctly; "Fat". In addition, 41% of the parents answered carbohydrates, 36.2% answered protein and 3.9% answered alcohol.

Impact of Parents' Nutritional Knowledge on Child's Eating Habits

The total score for this section (60) was divided into tertiles, where the lowest one referred to as "inadequate eating habits", the medium one referred to as "partially satisfactory eating habits" and the highest one referred to as "satisfactory eating habits". The mean score for this section was 36.3 ± 7.6, without any statistically significant differences between males and females (p = 0.312). The results showed that 4.5% reflected "inadequate eating habits", 61.4% reflected "partially satisfactory eating habits", while more than one-third of the sample (34.1%) showed "satisfactory eating habits". The eating habit that recorded the lowest score was that parents do not force their children to consume fish at least twice per week.

It was concluded that parents with quite good nutritional knowledge usually force their children to eat breakfast and to have at least 1 cup of milk per day, as compared to parents with insufficient nutritional knowledge. In addition to that, it was revealed that more knowledgeable parents do not offer their kids ready-to-eat meat, artificially flavored foods, and carbonated beverages in comparison with less knowledgeable parents. Results suggest that there is a significant positive "weak" relationship between parents' nutritional knowledge and childrens' eating habits

(r=0.229). Therefore, parents who have better nutritional knowledge, their children practice better dietary habits. Our results are in parallel with several studies, which indicated a significant positive association between higher nutritional knowledge of parents and better dietary intake in children (32, 44, 58). Our finding could be explained by the effect of the numerous environmental and individual factors that affect dietary behaviors, such as taste, availability, food cost or security, cultural or religious beliefs and perceptions about food and health (58, 59, 60). It is of high importance that future studies direct their focus into distinguishing the most substantial aspect of nutritional knowledge having the most significant correlation with dietary intake, which will not be only helpful for public health policy decision making, but would extend even to clinical counseling.

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