EFFECT OF FOOD HABITS AND NUTRITIONAL AWARENESS ON BODY MASS INDEX AND HEALTH STATUS AMONG GIRLS ADOLESCENTS OF INTERMEDIATE SCHOOLS IN MADINAH MUNAWARAH

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Abstract

   Background: Adolescence is defined by the World Health Organization as the period between childhood and adulthood, spanning from 10 to 19 years of age. Adolescence is a time of increased growth and development, in which a greater need for nutrients coincides with a change in food habits that also influences nutritional needs. Due to differences in body type, physical activity, and rate of growth, every adolescent has different nutritional needs. Objective: The present study aims to assess food habits and nutritional awareness for girls Adolescents and describes its relation with body mass index and health status and socio-demographic differentials.   Methodology: This study was carried out on 300 girls Adolescents aged 12 to 17 years were chosen from 32 intermediate schools Al Madinah Al Munawwarah, KSA. Data socioeconomic status, health history, food habits, anthropometric measurements and, Nutritional awareness were collected. Results: The mean value of age was 14.33 ± 1.11 years, the mean value of length was 150.86 ± 5.58 cm, the mean of arm circumference was 24.33 ± 2.71 cm and the mean value of weight was 47.71 ± 10.86 kg. Also the result showed that 11.7% of studied girls were suffering from overweight, while the most of girls had normal weight 52.0%, the mean value of body mass index mean was 20.82 ± 4.12 kg/m2. Most of girls 84.3% were no suffering from diseases, while about 15.7% of girls were suffering from diseases including; anemia, tuberculosis, diabetes

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mellitus. As for bad dietary habits were like eating one meal per day, delete the breakfast, and low rates of milk consumption, meat and fruits and vegetables daily. The nutritional awareness degree were classified into three degrees; of the categories; awareness is low (less than 60%), awareness is intermediate (greater than 60% - 79.9%), awareness is high (80% or more), the nutritional awareness level in the study sample, the most of girls 52.5% have middle level of awareness, while 38.1 % of them have high level of awareness, and finally 9.4% of them have low level of dietary awareness,. There was a statistically significant relationship between nutritional awareness degree and health status at (P <0.01), also there was a statistically significant relationship between nutritional awareness degree and anthropometric measurements (weight, body mass index). In conclusion: High percentage of girls adolescents hade a middle degree of d nutritional awareness This study recommended to the importance of raising awareness of food among teenagers, because of its positive effects to change some beliefs and habits inherited misconceptions. Stay nutrition education workshops for teenagers diet patrol through the institutions concerned.

Keywords: Food habits, nutritional awareness, , body mass index , adolescence, intermediate schools.

NTRODUCTION

Adolescent is defined by WHO as a person between 10-19 years of age. There are about 1.2 billion adolescents worldwide and one in every five people in the world is an adolescent (WHO, 2007). Adolescence is a crucial period for healthy development in both psychological and physical terms. It is a stage of development transition, i.e. a bridge between childhood and adulthood. It is the stage of development of adult mental process and about adult identity and transition from total socio-economic dependent to relative independent. The WHO has defined adolescence as:- a) Progression from appearance of secondary sex characteristics (puberty) to sexual and

reproductive maturity. b) Development of adult mental processes and adult identity. (Shirur, 2000).

The transition from childhood into adolescence often results in diets becoming less healthy. An unhealthy diet during adolescence can negatively affect growth and development, and is likely to persist into adulthood (Haerens et al., 2008). The phenomenal growth that occurs in adolescence, second only to that in the first year of life, creates increased demands for energy and nutrients. Total nutrient needs are higher during adolescence than any other time in the lifecycle (Forbes, 1992).

Nutrition and physical growth are integrally related; optimal nutrition is a requisite for achieving full growth potential.1 Failure to consume an adequate diet at this time can result in delayed sexual maturation and can arrest or slow linear growth (Story, 1992). Nutrition is also important during this time to help prevent adult diet-related chronic diseases, such as cardiovascular disease, cancer, and osteoporosis. Prior to puberty, nutrient needs are similar for boys and girls. It is during puberty that body composition and biologic changes (e.g., menarche) emerge which affect gender-specific nutrient needs (Story, 1992).

Nutrient needs for both males and females increase sharply during adolescence.1 Nutrient needs parallel the rate of growth, with the greatest nutrient demands occurring during the peak velocity of growth. At the peak of the adolescent growth spurt, the nutritional requirements may be twice as high as those of the remaining period of adolescence (Forbes, 1992).

Saudi Arabia has experienced rapid sociocultural changes caused by the dramatic rise in the economy of the Arabian Gulf region. This transformation, associated with major changes in food choices and eating habits, have become increasingly cause of the rising rates of overweight and obesity in the Saudi population (Al-Rethaiaa et al., 2010). The rapid development in the economy that took place in Saudi Arabia during the previous decades, resulted in the adoption of a sedentary lifestyle and

consumption of high fat and low-fiber diet among adolescents (Abalkhail and Shawky, 2002).

Poor nutrition during any of these stages can have lasting consequences on an adolescent's cognitive development, resulting in decreased learning ability, poor concentration, and impaired school performance (Stang and Story, 2005).

Adolescents spend a good deal of time away from home and many consume fast foods, which are convenient, but are often high in calories and fat. It is common for adolescents to skip meals and snack frequently (Greer FR, Krebs, 2006). Eating fast food (sugar-sweetened beverages, fried potatoes, fried chicken, hamburgers-hot pizza, and salty snacks) was associated with overweight (BMI ≤85th percentile (Shang et al., 2014). The gradual growth pattern that characterizes early childhood changes to one of rapid growth and development, affecting both physical and psychological aspects of health. Because all of these changes have a direct impact on the nutrient need and dietary behaviors of adolescents, it is important that health care providers develop a full understanding of how these developmental changes of adolescence can affect nutritional status (Mahan and Escott-Stump , 2008)

AIM OF STUDY

The study was carried out amongst adolescent Saudi female students of intermediate schools in Madinah, to evaluate food habits as well as nutritional awareness and their impact on health status and anthropometric measurements (Body mass index and weight) to raise their knowledge and motivate their attitude to practice sound nutritional habits.

SUBJECTS AND METHODS

This study was carried out on 300 adolescent Saudi female students aged 12 to 17 years were chosen from 32 intermediate schools from 5 regions that represent geographical areas (east, west, north, south and middle) in Al Madinah Al Munawwarah, KSA.

Data Collection:

Data were collected using self-administered questionnaire consisting of socio-demographic, health history, and dietary habits, anthropometric and blood pressure measurements.

Socioeconomic Status:

Data about age, education level of fathers and mothers, family size; children in order and family's income were done according to Park and Park, (1979).

Health state

Data about suffering from diseases, types of disease, taking medications, medications types, and taking dietary supplements were collected.

Food Habits:

Data about number of meals, eating breakfast, places of eating it, preferred foods and cooking method and some food items consumptions were collected.

Anthropometric Measurements:

Weight and height were measured with the subjects wearing light clothing, without shoes and were recorded to the nearest 0.1 kg, and 0.1 cm, respectively. Waist circumference was recorded according to Kuczmarski et al (2000).

Body mass index (BMI) and BMI percentiles for age and sex were determined based upon the established World Health Organization international anthropometrical references (WHO, 1995). Underweight in adolescents is defined as a BMI _5th percentile. A normal BMI ranges from the 5th to less than the 85th percentile. Overweight is considered between the 85th to <95th percentile & obesity as BMI _ 95th percentile (Bellizzi and Dietz, 1999).

Dietary awareness:

Data collected to assess knowledge attitude and practice about nutrition among adolescent Saudi female students attending data were collected by personal interview using well-structured questionnaire. It included 20 questions which are about knowledge, attitude towards food, nutrients, healthy diet and prevention of malnutrition. Evaluation done by giving each correct answer 1 and for wrong and don't know score of 0.

Statistical Analysis:

Data were analyzed using statistical for social science (SPSS) program, version 16.0. (SPSS, 1998).

Results

Epidemiological features of the studied sample of adolescent Saudi female students at middle schools were presented in table (1). It was noticed that the mean age of girls student was 14.33 ± 1.11 years for; the mean weight 47.71 ± 10.86; the mean height was 150.86± 7.45. The BMI mean was 20.82 ± 4.12 and the mean arm circumference was 24.33 ± 2.71.

Table (2) shows the percent distribution of female adolescents by weight categories. The incidence of underweight is 28.7% and normal weight is 52.0%. Also, the combined prevalence of overweight and obesity were 11.7% and 7.6% respectively in female adolescents.

Table (3) shows demographic characteristic of the study sample, the total number of study participants amounted to 300 female adolescents; most of them were enrolled at the third grade year 43.7%. Mothers' Middle / Secondary educations were among females by 37.7%, while father's university education was 34.3% and 58.5%, respectively. Furthermore, the percentage of working fathers was 61.1% as government employee, as for working mothers was 66.67% was unemployed, and the majority of the sample family sizes were 58.30% from 6 to 9. Moreover, the majority of students 35.3% had high family income more 6000 to 10000 Saudi Riyal, while 14.7% of them had low family income between 1000 to 3000 SR.

Table (4) shows health state of the study sample, the total number of study participants amounted to 300 female adolescents; 84.3% of them were not suffering from diseases, while about 15.7% of them were suffering from diseases 48.90% of them were suffering from anemia, and 10% of them were suffering from gastrointestinal diseases, and 8.30% of them suffering from hypertension, and 6.50% of them suffering from liver diseases and cardiovascular disease, while 8.30% of them suffering from diabetes mellitus. As for taking medications, the female adolescents were 74.7% do 4t taking medications, while 25.3% of them were taking different medications, including: 42.20% were sedatives and 32.70% were antibiotics, 5.20% were diabetic drugs, and 2.30% were hypertension drugs. The same table also illustrates, the female adolescents were 23.7% do not taking dietary supplements, while 76.3% of them were taking different dietary supplements.

Table (5) food habits of the study sample, the majority of female adolescents reported eating three meals daily 54%, and about 28.33% of them reported eating two meals daily, and 9.33% were eating more than four meals, while 8.34% of students reported eating one meal per day. The majority of female adolescents reported deleted the breakfast meal about 41.0%, while 16.0% of them reported delete lunch meal. It is clear from table (5) the majority of girls reported eating breakfast 51.70%, and about 48.30% of them did not reported eating breakfast. Regarding preferred foods, the majority of girls were preferred soft drinks 33%, while about 8.3% of them were preferred nuts. The majority of girls reported drinking tea 70%, and about 30% of them did not drinking. Regarding drinking water, the majority of girls were drunk more than 1.5 liter 55.30%, while about 44.70% of them were drunk less than 1.5 liter. The girls reported that 57.3% of them consumed fried foods 70%, while 76.0% of them consumed sweets. As for preferred cooking method, the majority of subjects were preferred 59.66%, while about 6.66% of them were preferred traditional (Mesabek) methods.

Table (6) shows lifestyle of the study sample, the total number of study participants amounted to 300 female adolescents; the percentages of female adolescents who have physical exercise 82.33% of them, while about 17.67% of them were not practice. As for types of physical exercises were 55.46% of them practiced light activities, and 42.52% of them practiced moderate activities, and 2.02% of them practiced vigorous activities. Time of physical exercises were 65.58% of them practiced less than 30 minutes, and 23.90% of them practiced between 30 to 60 minutes, and 10.52% of them practiced than 60 minutes. Female adolescents seem to watch TV was 52.0% for two hours, while 20.0% of them watching more than 6 hours.

Table (7) shows Dietary awareness questions which were requested in the study sample, as shown 20 questions for nutritional awareness were directed to female adolescents; it were as follows: What are the components of the full diet?, For a healthy diet should be consuming?, Aspects of good nutrition?, The most important primary energy sources?, To maintain the activity and safety of the body?, Drinking water frequently necessary for?, Of foods that work to build and renew the body's cells?, What of the following foods provide the body with protein?, There are abundant in fiber?, Of the most important sources of vitamins and minerals?, Vegetables rich in vitamins?, Iron deficiency lead to?, Zinc is important for?, There is an abundance of calcium?, The symptoms of anemia?, Enters in the composition of bone?, The symptoms of vitamin B deficiency?, Vitamin A is important for?, Lack of vitamin in D in food causes illness?, and Uses of vitamin C. The correct answer ratios were differed among themselves as shown in the table.

Table (8) shows dietary awareness level in the study sample, the most of female adolescents 52.5% have middle level of dietary awareness, while 38.1 % of them have high level of dietary awareness, and finally 9.4% of them have low level of dietary awareness, with mean value 11.40±4.52 correct answer/questions for all study sample.

Table (9) shows correlation matrix between health state and anthropometric , food habits in the study sample, there is a statistically

significant relationship between health state and weight, also body mass index at (P<0.05) and there is a statistically significant relationship between health state and food habits at (P<0.01).

Table (10) shows correlation matrix between nutritional degree and health state ,socio factors in the study sample, there is a statistically significant relationship between nutritional degree and health state at (P <0.01), also there is a statistically significant relationship between nutritional awareness degree and family income, mother's education, father's education, working mother and working father at (P<0.05).

Table (11) shows correlation matrix between nutritional awareness degree and anthropometric measurements in the study sample, there is no a statistically significant relationship between nutritional awareness degree and anthropometric measurements (Weight, Height, and Body mass index).

Discussion:

The main age of the studied female adolescents was 14.33 ± 1.11 years about 52% of had normal weight BMI, these results is in a concordance with those studies in Jeddah province, Saudi Arabia, which revealed that the main age of the studied adolescents was 14.2 ± 0.9 for female adolescents. About 50% of female had underweight BMI, it was noticed that 30% were normal weight for BMI (Alkoly et al., 2011).

Our study revealed that the prevalence of obesity and overweight is 11.7% and 7.6% respectively (19.3%). These results is in a concordance with those studies in the Eastern province Al-Hasaa, Kingdom of Saudi Arabia, which revealed that the combined prevalence of obesity and overweight was (23.9%) (Amin et al., 2008), which had the highest prevalence compared to other studies in KSA (El Hazmi et al., 2002). While another school- based survey in the Kingdom revealed that the overall prevalence of overweight was 11.7% and obesity was 15.8% (combined prevalence of obesity and overweight 27.5%) among the included subjects aged 6-18 years. Also Alkoly et al., (2011) revealed that the combined prevalence of obesity and overweight is equal at 27.1% in both genders from adolescents.

As for lifestyle of the percentages of female adolescents who have physical exercise 82.33% of them, while about 55.46% of them practiced light activities. 65.58% of them practiced less than 30 minutes. In general, our adolescents exercise is less than those in developed countries (Kann et al., 2000) this may be due to inadequate school physical activity programs for these students. Lack of regular physical activity constitutes a major risk factor for cardiovascular disease (Grundy et al., 1997). Encouraging adolescents into a sustainable active lifestyle will influence the incidence of adult heart disease and stroke in the future (Walton et al., 1999).

In the recent years, with the huge advances in technology and improved living standards, the overall energy intake has increased due to over nutrition. On the other hand, lifestyle is becoming more and more sedentary and energy expenditure is reduced. Our study supported that concept. The apparent differences in the rates observed from different studies carried out in different parts of KSA may be partly attributed to different socioeconomic status of the study samples, science social class is a pre- cursor to nutritional habit which is a risk factor for overweight and obesity. In addition to different socio-economic status, ethics and genetic difference may account for the variations in the prevalence of obesity between American and Saudi adolescents (Al-Rukban et al., 2003).

Our study revealed that female adolescents seem to watch TV was 52.0% for two hours, while 20.0% of them watching more than 6 hours. These results may explained that about 52% of girls had normal weight BMI, while Alkoly et al., (2011) showed that 41.4% of female adolescents spent >6 hours watching TV. These result concur with the result of Roberts et al. (2005), American youths spend 6.5 hours per day or 44.5 hours per week with media. Almost 4 hours per day listening to radio or recorded music, and 45 minutes per day reading magazines or books (not for school).

Our results revealed that the most of female adolescents were enrolled at the third grade year 43.7%. Mothers' Middle / Secondary educations were among females by 37.7%, while father's university education was 34.3% and 58.5%, respectively. Furthermore, the percentage of working fathers was 61.1% as government employee, as for working mothers was 66.67% was unemployed and the majority of the sample family sizes were 58.30%

from 6 to 9. Moreover, the majority of students 35.3% had high family income more 6000 to 10000 Saudi Riyal, while 14.7% of them had low family income between 1000 to 3000 SR.

The results showed that 84.3% of female adolescents were not suffering from diseases, while about 15.7% of them were suffering from diseases 48.90% of them were suffering from anemia. Iron-deficiency anemia is the most common nutritional deficiency noted among children and adolescents. Several risk factors are associated with its development among adolescents, including rapid growth, inadequate dietary intake of iron-rich foods or foods high in vitamin C, highly restrictive vegetarian diets, calorie-restricted diets, meal skipping, participation in strenuous or endurance sports, and heavy menstrual bleeding (Story et al., 2002 and Centers for Disease Control and Prevention,2002).

The results showed that there is a statistically significant relationship between health state and weight, also body mass index and there is a statistically significant relationship between health state and food habits. Also there is a statistically significant relationship between nutritional degree and health state also there is a statistically significant relationship between nutritional awareness degree and family income, mother's education, father's education, working mother and working father. Wronka (2013) he found that Socioeconomic differences in BMI were increase with age. Parents' higher education was associated with smaller BMI gain between the ages of 7 and 18 years. Mother and/or father had higher education the prevalence of underweight increased with age.

The results illustrated that the majority of female adolescents reported eating three meals daily 54%, and about 28.33% of them reported eating two meals daily, while the majority of female adolescents reported deleted the breakfast meal about 41.0%,. It is clear from table (5) the majority of girls reported eating breakfast 51.70%, and about 48.30% of them did not reported eating breakfast. Regardless of the regular consumption of breakfast, Niklas et al., (2001) argued that regular consumption of breakfast may control body weight due to the decrease in fat content in the diet because of the role it plays in minimizing the intake of high energy snacks.

Regarding preferred foods, the majority of girls were preferred soft drinks 33%, while about 8.3% of them were preferred nuts. The majority of girls reported drinking tea 70%, and about 30% of them did not drinking in the present study agrees with the study of El-Dosokey (2006) who reported that the adolescent girls individuals who drink tea immediately were 34.7 %. Also Habeeb (2008) study adolescent girls who deal drinks with sugar reported that the number of tea- spoon of sugar about one, two, three and over recorded (6.0, 32.0, 56.0 and 6.0%) respectively. The girls reported that 57.3% of them consumed fried foods 70%, while 76.0% of them consumed sweets. As for preferred cooking method, the majority of subjects were preferred 59.66%, while about 6.66% of them were preferred traditional (Mesabek) methods. Alkoly et al., (2011) reported that the mean food intake of adolescents in comparison to the recommended daily dietary allowances was high. Also eating behaviors for intermediate schools still require development.

A better understanding of adolescent's diet and eating behaviors is essential for relevant education and intervention programs. Additionally, enquiry tools specifically designed for adolescents are direly needed. The enquiry should encompass household food security, food diversity (as an indicator of nutritional quality), eating practices and underlying influences, and physical activity. These tools need to be developed and validated in different settings, in connection with school based or health center based intervention programs rather than as free standing research.

It could be concluded from the results that dietary awareness level in the study sample, the most of female adolescents 52.5% have middle level of dietary awareness,. These results are in agreement with Simopoulos, (1985) who reported that nutrition knowledge about composition of a balanced diet are tissue building and protective groups of food. The nutritional problems in Saudi Arabia are mainly due to a change in food habits, illiteracy and ignorance, rather than a shortage of food supply or low income. Therefore, it is essential for all people to eat a balanced diet which will provide the dietary requirements of all nutrients. Perhaps behavior modification with respect to food intake will be effective in the treatment of underweight (Simopoulos, 1985).

CONCLUSION

In conclusion, the study found that high percentage of female adolescent hade a middle degree of nutritional awareness and dietary knowledge. This finding is similar to other studies done in the kingdom in different cities, but there was no response. So this will enhance health authorities to create program to upraise the nutritional awareness of the community for this important stage, especially at primary health care levels and at school.

RECOMMENDATIONS

This study recommended to the importance of raising awareness of food among teenagers, because of its positive effects to change some beliefs and habits inherited misconceptions. Stay nutrition education workshops for teenagers diet patrol through the institutions concerned.

Table (1): Epidemiological features of studied sample (n = 300)

Mean ± SD	Variables
14.33±1.11	Age in years
47.71±10.86	Weight in Kg
150.86±7.45	Height in cm
20.82±4.12	Body Mass Index
24.33±2.71	Arm Circumference cm

Table (2): Distribution of the study sample (n = 300) according to BMI

Percent%	Frequency	Body mass index BMI classification (kg/m2)
28.7	86	Underweight (≥ 5th percentile)
52.0	156	Normal weight(from 5th to < 85 th percentile)
11.7	35	Overweight (85th to < 95th percentile)
7.6	23	Obesity (≤ 95th percentile)
100	300	Total

Table (3): Demographic characteristic of the study sample (n = 300)

Percent%	Frequency	Variables
School grades		
23.0	69	1st grade
26.3	79	2nd grade
43.7	131	3rd grade
7.0	21	not answers
100	300	Total
Mother's Education		
23	69	Illiterate / Primary
37.7	113	Middle / Secondary
32.0	96	University
7.3	22	High college level
100	300	Total
Father's Education		
18.0	54	Illiterate / Primary
34.3	103	Middle / Secondary
34.3	103	University
13.3	40	High college level
100	300	Total
Working Mother		
28.7	68	Government employee
4.7	14	Private sector employee
66.67	200	Unemployed
100	300	Total
Working Father		
61.1	183	Government employee
23.3	70	Private sector employee
15.6	47	Unemployed
100	300	Total
Family size		
22.0	66	3 − 5
58.30	175	6 − 9
19.70	59	More than 10
100	300	Total
Family Income/SR		
14.7	44	Low (1000 − 3000)
30.7	92	Intermediate (> 3000 − 6000)
35.3	109	High (> 6000 − 10000)
18.3	55	Very high (> 10000)
100	300	Total

Table (4): Health state of the study sample (n = 300)

Percent%	Frequency	Variables
Suffering from diseases		
15.7	47	Yes
84.3	253	No
100	300	Total
Types of disease		
48.90	23	Anemia
21.50	10	Gastrointestinal diseases
8.30	4	Hypertension
6.50	3	Liver diseases
8.30	4	Diabetes mellitus
6.50	3	Cardiovascular disease
100	47	Total
Taking medications		
25.3	76	Yes
74.7	224	No
100	300	Total
Medications types		
42.20	32	Sedatives
32.70	25	Antibiotics
2.60	2	Hypertension drugs
5.20	4	Diabetic drugs
17.30	13	Others
100	76	Total
Taking dietary supplements		
23.7	71	Yes
76.3	229	No
100	300	Total

Table (5): Food habits of the study sample (n = 300)

Percent%	Frequency	Variables
Number of meals daily		
8.34	25	One meal
28.33	85	Two meal
54	162	Three meal
9.33	28	≤ Four
100	300	Total
Delete of meals Intake		
41.0	152	Breakfast
16.0	48	Lunch
20.30	61	Dinner
22.70	68	No
100	300	Total
Eating breakfast		
51.70	155	Yes
48.30	145	No
100	300	Total
Preferred foods		
33	99	Soft drinks
8.3	25	Nuts
30	90	Fruit juice
23.7	71	Chocolate
31	93	Chips and snacks
Drinking tea		
70	210	Yes
30	90	No
100	300	Total
Drinking water more than 1.5 liter		
55.30	166	Yes
44.70	134	No
100	300	Total
		Fried foods
57.3	172	Yes
42.7	128	No
100	300	Total
		Sweets consumption
76.0	228	Yes
24.0	72	No
100	300	Total
Preferred cooking method		
6.66	20	Traditional (Mesabek)
18.34	55	Boiled or stir-fried
59.66	179	Grilled
15.34	46	Baking
100	300	Total

Table (6): Lifestyle of the study sample (n = 300)

Percent%	Frequency	Variables
Physical exercises		
82.33	247	Yes
17.67	53	No
100	300	Total
Types of physical exercises		
55.46	137	Light activities
42.52	105	Moderate activities
2.02	5	Vigorous activities
100	247	Total
Time of physical exercises		
65.58	162	< 30 min.
23.90	59	≤ 30- 60 min.
10.52	26	> 60 min.
100	247	Total
Number of watching T.V. hours		
52.0	156	Two
28.0	84	Four
20.0	60	More than six
100	300	Total

Table (7): Nutritional awareness questions which were requested in the study sample (n = 300)

Wrong answer		Correct answer		Questions
Percent%	Frequency	Percent%	Frequency	
46.67	140	53.33	160	What are the components of the full diet?
23.34	70	76.66	230	For a healthy diet should be consuming?
4.67	14	95.33	286	Aspects of good nutrition?
7.67	33	92.33	277	The most important primary energy sources?
30	90	70	210	To maintain the activity and safety of the body?
20	60	80	240	Drinking water frequently necessary for?
74.34	223	25.66	77	Of foods that work to build and renew the body's cells?
11.34	34	88.66	266	What of the following foods provide the body with protein?
43	129	57	171	There are abundant in fiber?
60	180	40	120	Of the most important sources of vitamins and minerals?
66.34	199	33.66	101	Vegetables rich in vitamins?
57.34	172	42.66	128	Iron deficiency lead to?
68.34	205	31.66	95	Zinc is important for?
36.34	109	63.66	191	There is an abundance of calcium?
54.67	164	45.33	136	The symptoms of anemia?
47.34	142	52.66	158	Enters in the composition of bone?
70.34	211	29.66	89	The symptoms of vitamin B deficiency?
70.67	212	29.33	88	Vitamin A is important for?
40	120	60	180	Lack of vitamin in D in food causes illness?
26.67	80	73.33	220	Uses of vitamin C?

Table (8): Nutritional awareness level in the study sample (n = 300)

Percent%	Frequency	Nutritional awareness level
38.1	114	High (less 60%)
52.5	158	Middle (60% - 79.9%)
9.4	28	Low (more 80%)
100	300	Total
11.41±4.52		Mean ± SD

Table (9): Correlation matrix between health state and anthropometric measurements, food habits

Health state	Correlation	Weight	Height	Body mass index BMI	Food habits
	Pearson correlation Sig. (2-tailed)	.-0.157* 0.025	-0.021* 0.024	-0.157* 0.033	-0.144** 0.016

* correlation is significant at the 0.05 level (2-tailed).

** Correlation is significant at the 0.01 level (2-tailed).

Table (10): Correlation matrix between dietary awareness degree and Socio factors

Nutritional degree	Correlation	Health state	Family income	Mother's Education	Father's Education	Working mother	Working father
	Pearson correlation	-0.012**	-0.079*	-0.015*	-0.079*	-0.052*	-0.059*
	Sig. (2-tailed)	0.063	0.058	0.013	0.043	0.056	0.028

* Correlation is significant at the 0.05 level (2-tailed).

** Correlation is significant at the 0.01 level (2-tailed).

Table (11): Correlation matrix between nutritional awareness degree and anthropometric measurements

Nutritional degree	Correlation	Weight	Height	Body mass index BMI
	Pearson correlation	-0.031	-0.154	-0.021
	Sig. (2-tailed)	0.332	0.053	0.758

* Correlation is significant at the 0.05 level (2-tailed).

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تأثير العادات الغذائية والوعى الغذائى على مؤشر كتلة الجسم والحالة الصحية بين المراهقات فى المدارس المتوسطة بالمدينة المنورة

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الملخص :

مقدمة : مرحلة المراهقة هى الفترة التى تبدأ بظهورعلامات البلوغ إلى النضوج الكامل ويتم فيها حدوث النمو الجسمى السريع وما يتطلبه ذلك من زيادة الطاقة والعناصر الغذائية وكذلك يتميز المراهقون بتأثرهم بأصدقائهم وتفضيلهم تناول الطعام خارج المنزل مما يؤثر على النمط الغذائى والعادات الغذائية التى تؤدى إلى ظهور بعض المشاكل الصحية. **الهدف** : تهدف هذه الدراسة الى تقييم العادات الغذائية والوعى الغذائى لدى المراهقات وعلاقتها بمؤشر كتلة الجسم والحالة الصحية.**المنهجية**: أجريت هذه الدراسة على ٣٠٠ طالبة من المراهقات تتراوح أعمارهن ١٢ إلى ١٧ سنة ، وقد تم اختيارهن ٣٢ مدرسة من المدارس المتوسطة بالمدينة المنورة ، المملكة العربية السعودية و تم جمع البيانات الاجتماعية والاقتصادية ، والتاريخ الصحي ، والعادات الغذائية، و القياسات الجسمية، و قياس الوعى الغذائى لديهن. **النتائج** : بلغ متوسط العمر (١٤,٣٣ ± ١,٤٢ عاما) وبلغ متوسط الطول (١٥٠,٨٦ ± ٥,٥٨ سم) ومتوسط الوزن (٤٧,٧١ ± ١٠,٨٦ كجم)، وبلغ متوسط محيط الزراع (٢٠,٨٢ ± ٤,١٢ سم) وكانت الغالبية العظمى للطالبات تتمتع بأوزان طبيعية ٥٢,٠٪ وسجلت نسبة ١١,٧٪ من الطالبات زيادة فى الوزن، وبلغ متوسط مؤشر كتلة الجسم (٢١,٩٨ ± ٤,٠٩ كجم/٢م)، بالنسبة للحالة الصحية للطالبات أظهرت النتيجة أن الغالبية العظمى من الطالبات ٨٤,٣٪ من الطالبات لا تعانى من أمراض، فى حين أن حوالي ١٥,٧٪ منهن يعانين من أمراض، تنوعت الأمراض بين نسبة ارتفاع ضغط الدم والسكري والربو والانيميا وأمراض الجهاز الهضمى. أما بالنسبة للعادات الغذائية السيئة كانت شائعة بين الفتيات مثل تناول وجبة واحدة فى اليوم ، وعدم تناول وجبة الإفطار ، وانخفاض معدلات استهلاك الحليب واللحوم و الفواكه والخضروات يوميا. وتم جمع البيانات الخاصة بالوعي لغذائى لدى المراهقات من خلال إستبيان تضمن على عدة أسئلة وتم التقييم من خلال إعطاء كل إجابة صحيحة ١ وإعطاء صفر للخطأ والاتى لا يعرفن النتيجة وتم تقسيم درجات الوعى الغذائى الى ثلاثة فئات وهي؛ وعى منخفض (أقل من ٦٠٪) ، وعي متوسط (أكبر من ٦٠٪ - ٧٩,٩ ٪) ،وعي مرتفع (من ٨٠٪ فأكثر)، وكانت النتيجة بالنسبة لمستوى الوعي الغذائي فى عينة الدراسة فقد بلغت نسبة ٥٢,٥٪ من المراهقات لديهن وعى متوسط، ، فى حين أن ٣٨,١٪ منهن لديهن

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مستوى عال من الوعي الغذائي، وأخيرا بلغت ٩.٤٪ لديهن مستوى منخفض من الوعي الغذائي ، كما دلت النتائج على أن هناك علاقة ذات دلالة إحصائية بين درجة الوعي الغذائي والحالة الصحية عند مستوى ($P < 0.01$)، وأيضا هناك علاقة ذات دلالة إحصائية بين درجة الوعي الغذائي مؤشر كتلة الجسم. التوصيات: توصى هذه الدراسة بضرورة إجراء دورات تثقيفية للطالبات وورش عمل حول التغذية السليمة ودورها فى مقاومة الأمراض ورفع الحالة الصحية، وإثراء مناهج الطالبات بالمعلومات الغذائية لترسيخ عادات وسلوكيات غذائية سليمة لدى الطالبات المراهقات.

الكلمات الدالة (المفتاحية): العادات الغذائية، الوعى الغذائى، مؤشر كتلة الجسم، المراهقات، المدراس المتوسطة.