Nutritional status, Dietary pattern and relevant knowledge among adolescent girls in Benghazi

By

Sabah Saleh Mohammed

Supervisor

Dr. Fatma Saleh Ben Khaial

This Thesis was Submitted in Partial Fulfillment of the Requirements for Master's Degree of Nutrition.

University of Benghazi

Faculty of Public Heath

March 2018

University of Benghazi

Faculty of Public Health

Department of Nutrition

NUTRITIONAL STATUS, DIETARY PATTERN AND RELEVANT KNOWLEDGE AMONG ADOLESCENT GIRLS IN BENGHAZI

By
Sabah Saleh Mohammed

This Thesis was Successfully Defended and Approved on **24.3.2018**

Supervisor
Dr. Fatma Saleh Ben Khaial

Signature: .....

Dr. Ali Elmabseut **(Internal examiner)**

Signature: .....

Dr. Raja Elzahaf **(External examiner)**

Signature: .....

Dr. Abdelhamid Elbarghathi
(Dean of Faculty)

Prof. Mohamed Saleh Buamud
(Director of Graduate studies and training)

إهداء

إلي أبي وأمي

إلى أسرتي و صديقاتي

وإلي كل من أضاء بعلمه عقل غيره

أو هدى بالجواب الصحيح حيرة سائليه

فأظهر بسماحته تواضع العلماء

وبرحابته سماحة العارفين.

صباح صالح

Acknowledgment

I would like to express my gratitude to my supervisor Dr. Fatma Ben Khaial for all the help and time and effort to complete the Master's thesis. Furthermore I would like to thank the Dean of the Faculty of Public Health, the Head of the Nutrition Department and the Ministry of Education of Benghazi for facilitating the research procedures. Also, I like to thank the participants in my survey. Who have willingly shared their precious time during the process of interviewing. Thanks to all my family members and friends for supporting me.

Sabah Saleh

Contents **pages**

List of tables:

List of figures:

List of abbreviation:

Abbreviate	Meaning
FFQ	Food Frequency Questionnaire
BMI	Body Mass Index
USA	United State of American
NKT	Nutritional Knowledge Test
RDA	Recommended Daily Allowance
RDI	Recommended Daily Intake
wt	Weight
ht	Height
CDC	Centers for Disease Control and Perversion

List of Appendices:

Abstract:

Introduction: The nutritional status of adolescent girls, the future mothers, contributes significantly to the nutritional status of the community. **Aim:** Assessment of nutritional status, dietary pattern and the relation between the nutritional status and their relevant knowledge. **Methods:** A cross-sectional study included 380 adolescents Libyan girls from secondary school in Benghazi aged 15–19 years. Nutritional status was evaluated by measurement of height and weight for body mass index (BMI) and dietary pattern was assessed by using food frequency questionnaires (FFQ). Also nutritional knowledge evaluated by using nutritional knowledge test (NKT). **Results:** revealed that the prevalence of obese adolescent among sample 34 was(11percent), (13.7percent) overweight, (5.3percent) underweight and (70percent) were normal weight (healthy weight). The daily consumption of milk and dairy product was (70.5 percent), bread and cereal (98.9 percent), fruit (54.5percent),vegetable (61.6 percent) meat (70.3percent)egg (40percent) legumes (7.6 percent**),** sweets (81percent),beverage(tea, coffee) (46.8 percent),soft drink (40.3percent) fruit juice (73.7percent), and junk food (19.5 percent).Total NKT scores were (58 percent) good knowledge score,(34 percent) bad knowledge score then (8 percent)very good knowledge score. **Conclusion:** A large proportion of adolescent girls were having about (30percent) unhealthy weight. The dietary pattern was reported that a large number of adolescents had a healthful diet. But the consumption of unhealthy food like sweets daily was very high (81.3percent). No statistical significant relationship between BMI (healthy weight/unhealthy weight) and NKT scores (P = 0.694).Health education programs and effective policies are required to promote healthy eating and physical activity.

Chapter 1
Introduction and literature review

1.1 Adolescence definition and growth :

The term “adolescents”, as defined by the World Health Organization (WHO), includes persons aged 10–19 year (Anand,2016;Omobuwa ,2014;WHO,2005). Adolescents make up roughly (20 percent) of the total world population (Omobuwa,2014).

It is one of the most challenging periods in human development (Dapi,2005). It is an important stage of growth and development in the lifespan (Maiti,2011).

Adolescence, the transition from childhood to adult life, is one of the most rapid phases of physical growth. One-third of all the growth in a life time occurs during this stage. It starts with the onset of puberty. The period of adolescence has wide cultural and individual variation (Alkoly,2011).

During adolescence, 20 percent of final adult height and 50 percent of adult weight are attained, bone mass increases of 45 percent and dramatic bone remodeling occur and soft tissues, organs, and even red blood cell mass increase in size (Mulugeta, 2009).

Adolescents experience periods of rapid growth associated with hormonal, cognitive and emotional changes, these are often confounded by lifestyle changes, such as, changing schools or starting work (Alkoly,2011).

1.2.Nutritional status during adolescence :

Nutritional status during adolescence plays an important role in human lifecycle (Doustmohammadian,2013). Adolescent may represent a window of opportunity to prepare nutritionally for a healthy adult life (Maiti,2011;Omobuwa,2014).

The nutritional status of adolescent girls, the future mothers, contributes significantly to the nutritional status of the community (Anand,2016;Patanwar,2013; Venkaiah,2002).Under-nutrition among adolescent girls is a major public health problem leading on impaired growth (Patanwar,2013).

Malnutrition (under nutrition or over nutrition) which refers to an impairment of health either from a deficiency or excess or imbalance of nutrients. It is of public health significance among adolescents all over the world (Doustmohammadian,2013;Singh,

2013). It creates lasting effect on the growth, development and physical fitness of a person (Doustmohammadian,2013).

In general adolescent girls are the worst sufferers of the ravages of various forms of malnutrition like (protein energy malnutrition, iron, iodine, calcium, vitamin A and other specific nutrient deficiencies) because of their increased nutritional needs but decreased intake. At the same time low literacy level, lack of nutrition related knowledge and lack of awareness about their nutritional requirements further aggravate this dismal situation (Choudhary,2010).

Among adolescents, both under and over-nutrition are present in particular in developing countries ,which is represented as obese/overweight, then wasting/underweight, and in the long term as stunting (Montazerifar,2012).

In developing countries, factors associated with under nutrition of adolescents are:
1-Poor household economic condition.

2-Periodic food-shortage.

3-Child labour (marker of household income-poverty).

4-Burden of disease.

5-Poor knowledge about long-term consequences of under nutrition of adolescents.

6-Quantity and quality of food.

7-Access to health and nutrition services (Alam,2010).

Although, The global economic development and urbanization has resulted in great changes in the weight status of adolescents worldwide . A decreasing trend in the prevalence of under nutrition has been identified in developing countries.

On the other hand, an increasing shift towards higher rates of overweight and obesity among adolescents has been reported in developed and developing countries (Doustmohammadian,2013).

The proportion of adolescents who are overweight or obese is rapidly increasing worldwide. Adolescence is a vulnerable period for the development of obesity and also

appears to be a critical period for establishing risk factors for some chronic diseases in adulthood (Thakur,1999).

Obesity management is an important step in the prevention and control of chronic/non communicable diseases, such as cardiovascular disease, diabetes, hypertension, and some kinds of cancer . These diseases contribute to 60% of overall morbidity and mortality in most Arab countries (Musaiger,2012).

1.3. Nutritional needs and dietary pattern during adolescence :

Owing to sudden and special growth taking place during adolescence, the nutritional requirements also increase tremendously compared to preceding years of growth. During this phase, diet should provide not only sufficient calories but also essential elements and nutrients such as protein, vitamins and minerals required for growth.

Nutritional and physical growth during adolescence creates increased demands of energy and nutrients such as vitamin B6, B9, B12, A, and C. Thiamin and riboflavin play essential roles in energy metabolism so are important in this cycle (Doustmohammadian,2013).

Nutritional deficiencies has far reaching consequences, especially in adolescent girls. If their nutritional needs are not met, they are likely to give birth to undernourished children, thus transmitting under nutrition to future generations (Maiti,2011).

Nutritional inadequacies influence not only adolescents health but also the risk for major chronic diseases in adulthood (Yannakoulia,2004).

Dietary inadequacy is more common among adolescent girls than in any other segment of the population. The significance of this statistic is increased by the fact that adolescence is a time when adequate nutrition can lead to health problems that persist throughout life. Special concern is focused on nutritional inadequacy in female adolescents because they may become pregnant and need to additional nutritional, physical and emotional demands of pregnancy, child birth and lactation (Shaaban,2009).

Factors that tend to reduce macro and micro nutrient intake of adolescent girls may be unequal intra-familial distribution of food, adverse and harmful dietary practices including dieting, specific food taboos and dietary restrictions during menstruation, pregnancy and lactation (Choudhary,2010).

Inadequate diet during this time can results in :

1.Decreased learning ability.

2.Iron deficiency anemia.

3. Lack of concentration.

4. Impaired school performance, and slow growth.

On the other hand, some of the teenage girls are under a controlled diet to reduce their body weight, which may result in nutritional deficiencies.

Additionally, unsuitable food habits increase obesity and or underweight, and the risk of incidence of diet-related chronic diseases among adolescents (Montazerifar,2012).

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 (Alkoly,2011).

Adolescents tend to eat differently than they did as children. Factors like the quest for independence and acceptance by peers, increased mobility, greater time spent at school and or college and or work activities and preoccupation with self-image that may affect adolescent's food choices. All these factors contribute to the irregular and unhealthy eating behaviors that are common among adolescents. Busy schedules may lead to meal skipping, snacking throughout the day and more eating away from home. Peer pressure is very high during adolescence (Barooah,2012).

Girls skip meals in their anxieties to be thin. This attitude reduces their intake of food and thus their body become deficient of many important nutrients. This may lead to anaemia and low bone density in adulthood. Teen girls need particular attention to iron because their iron stores are depleted each month following menstruation.

Deficiency is one of the most common nutritional disorder. National and population based surveys have found that adolescents often fail to meet dietary recommendations for overall nutritional status and for specific nutrient intakes (Barooah, 2012).

Many adolescents receive a higher proportion of energy from fat and or added sugar and have a lower intake of vitamin A, folic acid, fiber, iron, calcium and zinc than is recommended . The law intake of iron and calcium among adolescent girls is of particular concern. Iron deficiency can impair negative functions and physical performance and inadequate calcium intake may increase fracture risk during adolescence and the risk of developing osteoporosis in later life (Barooah,2012).

Since adolescence is a critical period for the progression of healthy nutrition behaviors, adequate energy, nutrient intake, and healthy snacks in this period can lead to optimal growth and prevent chronic diseases such as obesity, diabetes, cardiovascular disease and hypertension (Montazerifar,2012).

Fast food typically refers to food that is quickly prepared, purchased in self-service from restaurants with precooked ingredients, and served in a packaged form to the customer to take-away such as burgers, french fries, and pizza.

Moreover, a strong positive association has been reported between fast food consumption and both weight gain and insulin resistance, suggesting that fast food increases the risks of obesity and type 2 diabetes (Al-Faris,2015).

Validated food frequency questionnaires (FFQ) and food intake reports are instruments used to derive dietary patterns. Most of the studies regarding dietary patterns have been performed in adult populations. There are few reports in adolescents. It has been suggested that unhealthy dietary patterns are present from early stages of life. The impact on unhealthy outcomes like overweight, obesity or some other metabolic disorder are still controversial in children and adolescents (Pliego,2016).

Following a trend shown in studies in the nutrition area, the association between adolescents' diet and health should not consider the presence or absence of a particular nutrient, but the group of consumed foods, considering the type, amount, and proportions.

In fact, the evaluation of food groups better reflects the dietary habits of a given population, and expresses the actual situation of food availability and the differentiated conditions of inclusion of the populations in varying social scenarios.

In addition, food consumption patterns can be used as a prognostic factor in the association between diet and chronic disease risk, especially when they are associated with dietary characteristics (Pinhoa,2014).

1.4 Nutritional assessment:

Nutritional status is better assessed with anthropometry in adolescence (Omobuwa,2014). Anthropometry is defined as the body shape quantitative expression technique. During adolescence, it is the most accessible and universally applicable method, since it is of low cost, simple, and noninvasive, being liable to be used by any motivated and responsible professional. Its greatest disadvantage is not identifying the deficiency or excess of a more specific nutrient; so, the anthropometric indicators used in the nutritional assessment of adolescents are not specific and can be considered only as criteria that suggest increased nutritional risk (Eisenstein,2000).

In particular anthropometry has been used during adolescence in many contexts related to nutritional status .According to World Health Organization, the ultimate intention of nutritional assessment is to improve human health. It is well recognized worldwide that anthropometric measurements are indispensable in diagnosing under nutrition. It has now been well established that the body mass index (BMI) is the most appropriate variable for determining nutritional status among adolescents (Mukhopadhyay,2005). For this reason , in this study BMI will be used for assessment of nutritional status.

Table I : Categorization of BMI according to percentiles for children and adolescents(Barlow,2007;CDC,2009; Daniels,2009)**.**

Percentile Ranking	**Weight status**
Less than 5^{th} percentile	Underweight
5^{th} percentile to less than 85^{th} percentile	Healthy weight
85^{th} percentile to less than 95^{th} percentile	Over weight
Equal to or greater than 95^{th} percentile	Obese

1.5 Nutritional knowledge:

Common belief is that acquiring nutritional knowledge will itself lead to improved dietary practices. Nutritional knowledge can be gained by means of nutrition education.

Nutrition education can be defined as "the process of helping individuals to develop the knowledge, skills and motivation needed to make appropriate food choices throughout the life". The health habits established affects the quality of life. By practicing wellness, healthy life can be achieved (Thanuja,2007).

In addition, nutritional knowledge is influenced by biological and social factors (e.g. age, gender and social status) in both adolescents and adults.

Good habits for proper life management includes:
1-Choosing and eating nutritious food.
2-Exercising regularly.
3-Having adequate sleep.
4-Learning to handle stress.
5-Avoiding harmful substances (Thanuja,2007).

Dietary knowledge and access to resources are critical to improve health and nutrition in a sustainable way. Adolescence is the time to learn and adopt healthy habits to avoid many health and nutritional problems later in life.

Adolescents have more easy access to health and nutrition information through schools, recreational activities, and mass media than they have later in their lives (Alam,2010).

Adolescents are future parents. Particularly women play a significant role in the development of their off spring. So if they have better nutritional knowledge and awareness they well improve the nutritional status of their family members and good health can be maintained (Thanuja,2007).

The risk of obesity and obesity-related conditions in adulthood is greater in individuals who are overweight during adolescence. Efforts to both prevent and manage obesity in adulthood and adolescence usually emphasize nutrition information/knowledge, ie, appropriate food choices and methods of calorie reduction. An underlying assumption of this approach is that poor understanding or lack of knowledge about nutrition could lead to weight gain (Thakur,1999).

The best possibility of measuring abilities and knowledge is the use of multiple choice tests when all items show the same number of alternatives and only one of the answers to choose from is correct (Kersting,2008).

Because the importance of adolescence period and because of many changes occur during this period that affect their nutritional pattern and increase nutritional needs as well as the importance of nutritional knowledge which reflecting on their nutritional status, for all these reasons this study was conducted.

1.6 literature reviews :

There are many studies conducted on the nutritional status, nutritional pattern and nutritional knowledge of adolescent girls in several countries which are listed below:

Relationship of nutrition knowledge and obesity in adolescence in USA study by Thakur, et al, (1999) The prevalence of obesity was (26 percent). There were no significant differences in nutrition knowledge between the obese and non-obese students with the exception that obese students were better able to identify high fiber foods. In addition, obese students were more likely to report infrequent meals with their family. Otherwise, there were no significant differences in nutrition behaviors or food preferences. Overall nutrition knowledge did not differ between obese and non-obese adolescents.

Kersting,et al,(2008) studied the food and nutrient intake, nutritional knowledge and diet-related attitudes in European adolescents. The study revealed that total NKT scores in the different centers ranged between (50 to 70 percent) of the maximum twenty three points. Mean scores were significantly different between centers. Age, BMI and gender had no significant effect on knowledge results. In general, girls had higher values than boys. In girls, there was a tendency for higher scores with increasing age and lower scores with increasing BMI.

Alam, et al, (2010) studied nutritional Status, dietary intake, and relevant knowledge of adolescent girls in rural Bangladesh. Results revealed that 26 percent of the girls were thin, with body mass index(BMI)-for-age <15th percentile),(0.3 percent) obese (BMI-for-age >95th percentile), and (32 percent) stunted (height-for-age ≤2SD) . The overall dietary knowledge was low. More than half could not name the main food sources of energy and protein, and (36 percent) were not aware of the importance of taking extra nutrients during adolescence for growth spurt .Community-based adolescent-friendly health and nutrition education and services and economic development may improve the overall health and nutritional knowledge and status of adolescents.

Dietary pattern and nutrition related knowledge of rural adolescent girls was studied by Choudhary, et al, (2010) found more than two third subjects had inadequate intake of calorie, protein and fat. High level of vitamin A deficiency prevailed in majority (>90 percent) of subjects. Average intakes of macro and micronutrients (except vitamin A) were(>70 percent) of the RDA. Average intakes of both macro and micronutrient (except vitamin A) were least in 10-12 years age group. Access of nutrition related knowledge was poor for adolescent girls. Their nutrition related knowledge was not up to the mark and majority of them were not aware about their nutritional needs. Ignorance about micronutrients and protective foods prevailed in adolescent girls.

Przysławski,et al, (2011) studied the dietary habits and nutritional status of female adolescents from the Great Poland Region. The study revealed that (13.7percent) of females were underweight,(7.7percent) were overweight and (1.2percent) were obese. Cluster analysis resulted in 3 clusters, of which the second one showed the most detrimental nutritional habits. This cluster was characterized by the lowest intake of dairy products, fruits vegetables, fish, meat and also by frequent long breaks between meals (longer than 5 hours). Improper nutritional behavior is a frequent finding in female adolescents in Poland.

Nutritional knowledge in European adolescents: results from the HELENA (Healthy Lifestyle in Europe by Nutrition in Adolescence) study by Sichert-Hellert, et al, (2011).They found that Nutritional knowledge test (NKT) scores increased with age and girls had higher scores compared with boys (62 percent v. 59 percent; $P<0.0001$). Scores were approximately (10 percent) lower in 'immigrant' adolescents or in adolescents with 'immigrant' mothers. Misconceptions with respect to the sugar content in food or in beverages were found. Overall, there was no correlation between BMI values and NKT scores. After categorization according to BMI, scores increased significantly with BMI group only in boys.

Musaiger,et al,(2012) in Bahrain studied the prevalence of overweight and obesity among adolescents in seven Arab countries, namely, Algeria, Jordan, Kuwait,

Libya, Palestine, Syria, and United Arab Emirates. The study revealed that males overweight was highest among Kuwaiti adolescents (25.6 percent), followed by Jordanian (21.6 percent), and Syrian (19.7 percent) adolescents. Available statistics indicate that an alarming proportion of people in most Arab countries suffer from obesity. Studies have revealed that the prevalence of overweight and obesity among adolescents in Arab countries ranges from (18 percent to 44 percent). In general, overweight has been found to be more prevalent than obesity in both boys and girls. However, the prevalence of obesity by gender at the adolescent stage (10–18 years) does not indicate the same trend. In countries such as Bahrain, Egypt, Tunisia, Kuwait, and Qatar, the prevalence of overweight and obesity is higher among girls than boys. In some countries such as Lebanon and the United Arab Emirates (UAE), the percentage of overweight and obesity is higher in boys than girls . Among females the highest prevalence of overweight was reported in Libyan adolescents (26.6 percent), followed by Kuwaiti (20.8 percent), and Syrian (19.7 percent) adolescents, as for obesity, Kuwaiti adolescents showed the highest prevalence of obesity for both males (34.8 percent) and females (20.6 percent).

Montazerifar, et al, (2012) studied the evaluation of dietary intake and food patterns of adolescent girls in Sistan and Baluchistan Province, Iran. They found lower dietary intake of energy,calcium, zinc, vitamin C and folate compared to the Dietary Reference Intake (DRI).The infrequent intake of milk and dairy products, fruits and vegetables, and a high consumption of empty calorie foods e.g. salty snacks, sweets, soft drinks and junk foods were seen among adolescents.

Dietary pattern of school going adolescents in Urban Baroda, India was studied by Kotecha, et al,(2013).They revealed that nearly (80 percent) of adolescents had consumed regular food, like dal, rice, chapati, and vegetables, including green leafy vegetables. (50 percent) of them had consumed chocolates, and about one-third consumed fast foods. (60 percent) of adolescents had their breakfast daily while the remaining missed taking breakfast daily. Nearly one-third of adolescents were missing a meal once or twice a week. A large majority had consumed regular foods. However, more than half of them had consumed chocolates, soft drinks, and over one-third had taken fast foods.

Nutritional status and dietary intake among adolescent girls in Iran, was studied by Doustmohammadian, et al,(2013). their results showed that the prevalence of underweight, normal weight, overweight, and obese was (5.7 percent), (77.7 percent), (11.7 percent), and(4.7 percent) in Semnan adolescent girls, respectively.

Identification of dietary patterns of adolescents attending public schools was studied by Pinhoa L et al (2014) found that the three dietary patterns identified, ‘‘junk food,’’ ‘‘healthy,’’ and ‘‘traditional’’, explained (23.26 percent), (6.90 percent), and (5.24 percent) of data variability, respectively. Adolescents with per capita family income exceeding half a minimum wage were more likely to consume the ‘‘junk food’’ pattern (OR = 1.66; 95% CI = 1.07-2.56), and overweight adolescents had lower chances of eating the ‘‘healthy’’ food pattern (OR = 0.56, 95% CI = 0.35-0.91).

Chapter 2
Aim and objectives

2.Aim of the study :

To study nutritional status , dietary pattern and relevant nutritional knowledge among adolescent girls in Benghazi/2014.

2.1 Objectives of the study:

1-To assess the nutritional status of adolescent school girls.

2-To know the pattern of their dietary intake.

3-To find out the relation between the nutritional status of adolescent girls and their relevant knowledge regarding some nutritional issues.

Chapter 3
Methodology

3.Methodology :

3.1 Subjects and methods:

3.1.1 Study design:

A Descriptive cross sectional study.

3.1.2 Research setting, subject and period :

Adolescent secondary school girls aged (15-19y) enrolled in girls governmental secondary schools in Benghazi city, during the period from 1st January to 30th April 2014.

The inclusion criteria were all healthy Libyan girls aged (15-19y) enrolled in secondary school agree to participate in the study and have no one of the following exclusion criteria .

The exclusion criteria were those who are absent or not agree to participate or diabetic or on special drug or supplement.

3.1.3 Sample size:

The total number of female students was 15964 , sample size was determined by Krejcie,Morgan (1970). The sample size was estimated to be 380 adolescent girls .

3.1.4 Sampling:

Stratified random sampling by ranks (10th,11th ,12th grades of secondary school) from twelve secondary schools from six different areas of Benghazi city these are :

1- Benghazi Center region selected eighty student randomly from eighteen classroom from three schools.
2- Al-Barka (1) region selected seventy five student randomly from twelve classroom from two schools.
3- Al-Barka (2) region selected seventy nine student randomly from twelve classroom from two schools.

4- Al-Barka (3) region selected thirty seven student randomly from twelve classroom from two schools.

5- Al-Salawi (1) region selected fifty seven student randomly from twelve classroom from two schools.

6- Al-Salawi (2) region selected fifty two student randomly from six classroom from one school.

3.1.5 Data collection tools:

1- Socio-economic:

Using predesigned interview questionnaire included socio-economic data (age, residence, social status ,education of parent, job of parent and income) (appendix A).

2 -Anthropometric measurement :

Measure of weight , height and BMI for assessment nutritional status of students.

Body weight was measured to the nearest 100 g by a electronic balance scale, with minimal clothing and without shoes (appendix B).

Height was measured to the nearest cm with the participant in a standing position without shoes using tap measure (appendix C).

BMI was calculated by dividing the weight in kg by the square of height in meters. (BMI=wt kg/ ht $(m)^2$) and then compared to standard CDC (Centers for Disease Control and Perversion) chart for girls age from 2 to 20 years (Kuczmarski,2002).

According to CDC the Classification of BMI for adolescence are Underweight (less than 5^{th} percentile), Healthy weight (5^{th} percentile to less than 85^{th} percentile) Over weight (85^{th} percentile to less than 95^{th} percentile) and Obese (Equal to or greater than 95^{th} percentile) (Barlow 2007,CDC 2009, Daniels 2009).

In addition, according CDC the sample was divide to two groups:

1) Healthy weight group included only healthy weight.
2) Unhealthy weight group included underweight, overweight and obese.

3-Dietary pattern assessment:

Evaluation of the nutritional pattern according to the consumption of various groups of the food pyramid and unhealthy food by using Food Frequency Questionnaires (FFQ) administered by the investigator (appendix A).

The FFQ include forty items food divided on eight groups: group one milk and dairy product (whole milk, skim milk,…..etc), group two starch (bread, rice ,pasta …etc), group three fruit, group four vegetable, group five meat group and substitutes (fish ,poultry, red meat ,egg, and legumes), group six sweets (cake, chocolate..etc), group seven beverages (tea ,coffee, fruit juice…..etc) and group eight junk food(fried food, burger …….etc).

4 -Nutritional knowledge test (NKT):

Knowledge was tested by using a modified nutritional knowledge test. (Musaiger ,(n.d))

There were sixteen different questions about healthy food (macronutrient, micronutrient and others question) (appendix A).

The knowledge was tested by using questions which carry one correct answer and two wrong answers. Then summation of the correct answers for each participant was estimated and accordingly scored as :

1-Bad score < 50 percent .

2-Good score (≥50 percent to <75percent).

3- Very good score (≥75 percent).

3.2 limitation of the study:

The security situation in Benghazi and school closure was the reason for spending more time to complete the research.

3.3 Statistical analysis:

Statistical analysis was carried out by using statistical package of social science (SPSS) version 18. Descriptive statistics were used as mean, minimum ,maximum, stander deviation, frequencies and percentage. The data was presented as tables and figures. Figures done by Microsoft Excel 2010. Analytical statistics, Chi square was used and regard significant when p value ≤ 0.05. Pilot study of the questioner was tested by ten students and accordingly it was modified .

3.4 Ethics:

The University administrators, director of the nutrition department, faculty and municipality of education were informed in writing about the aim of the study to obtain the maximum possible cooperation to conduct the study.

An informed consent was obtained from the subject, and so all the necessary steps for carrying out these (anthropometric measurement) was done in private place and the name was not mentioned. The investigator herself fulfills the required information from the student after giving them a briefing about the aim of the study.

Chapter 4
Results

4. Results :

The total number of female students in secondary schools in Benghazi during 2014 was 15964 and sample size was 380 randomly selected .

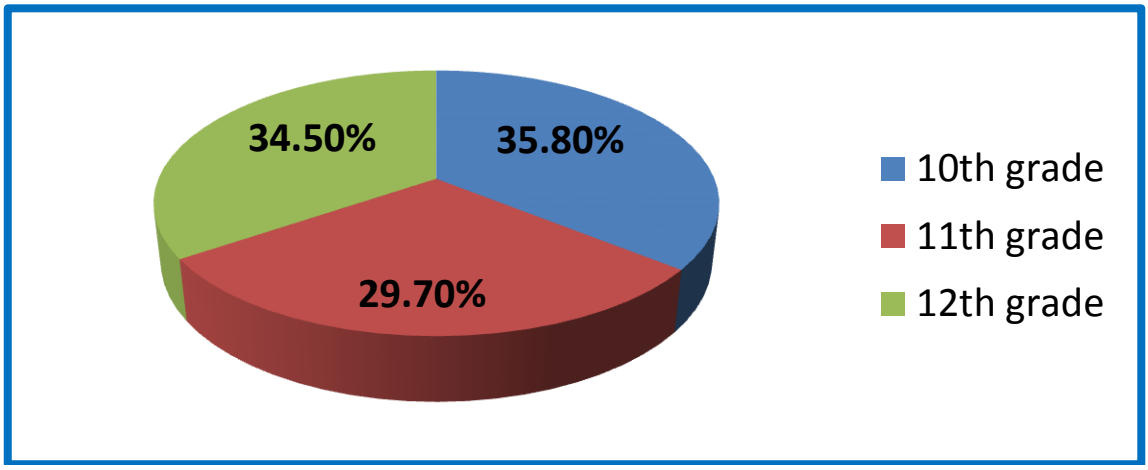

Figure 1: Distribution of the participant according to their educational grade

4.1 Socio-economic:

The mean age of adolescent girls was (16.7years±1.02). while minimum age was (15 years) and maximum age was (19 years) .The mean of family size was eight , while minimum and maximum were three and sixteen respectively. The mean rank of girls among family was four while minimum and maximum were one and thirteen respectively.

Table 1 : Some socio-economic characteristic of students family

Demographic data	N	%
Education level of mother		
Primary	61	16.1
Intermediate	113	29.7
Secondary	96	25.3
University	110	28.9
Education level of father		
Primary	36	9.5
Intermediate	99	26.1
Secondary	116	30.5
University	129	33.9
Job of mother		
House wife	278	73.2
Employed	102	26.8
Job of father		
Retired	29	7.6
Self employed	123	32.4
Governmental job	228	60
Family income		
Less than 500	40	10.5
From 500 to 1000	248	65.3
More than 1000	92	24.2

Table 1 shows the socio-demographic data of family of student adolescent girls the education level of mother was (16.1 percent) primary, (29.7 percent) intermediate, (25 percent) secondary and (28.9 percent) university. While the education level of father was (9.5 percent) primary, (26.1 percent) intermediate, (30.5 percent)secondary and(33.9 percent) university. The job of mother were (73.2 percent) house wife and (26.8 percent) were employed . The job of father was (7.6 percent) retired ,(32.4 percent)self employed and (60 percent) governmental job. This study revealed that family income were (65.3 percent) (from 500 to 1000 dinar), (24.2 percent) (more than 1000 dinar) and (10.5 percent) (less than 500).

4.2 Nutritional status :

This study revealed that mean of heights (160.57cm ±5.55) minimum (144 cm) and maximum (178cm) .Mean of weights (59.25Kg ±13.09) ,minimum (39.5kg), maximum (130kg). Mean of BMI (22.9 kg /m^2± 4.75), minimum (15 kg /m^2),maximum (44.0 kg /m^2) .

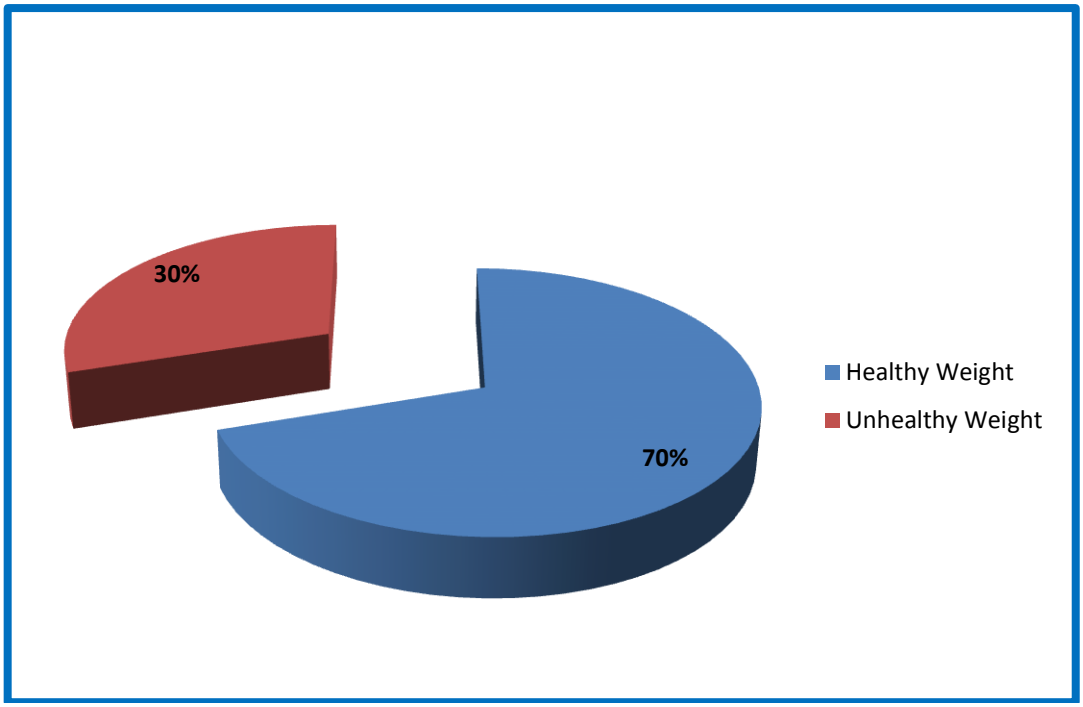

Figure 2 : Distribution of nutritional status according BMI percentile

Then divided the BMI to two groups healthy weight (70 percent) and unhealthy weight (30 percent) to express on the nutritional status of sample (Figure 2).

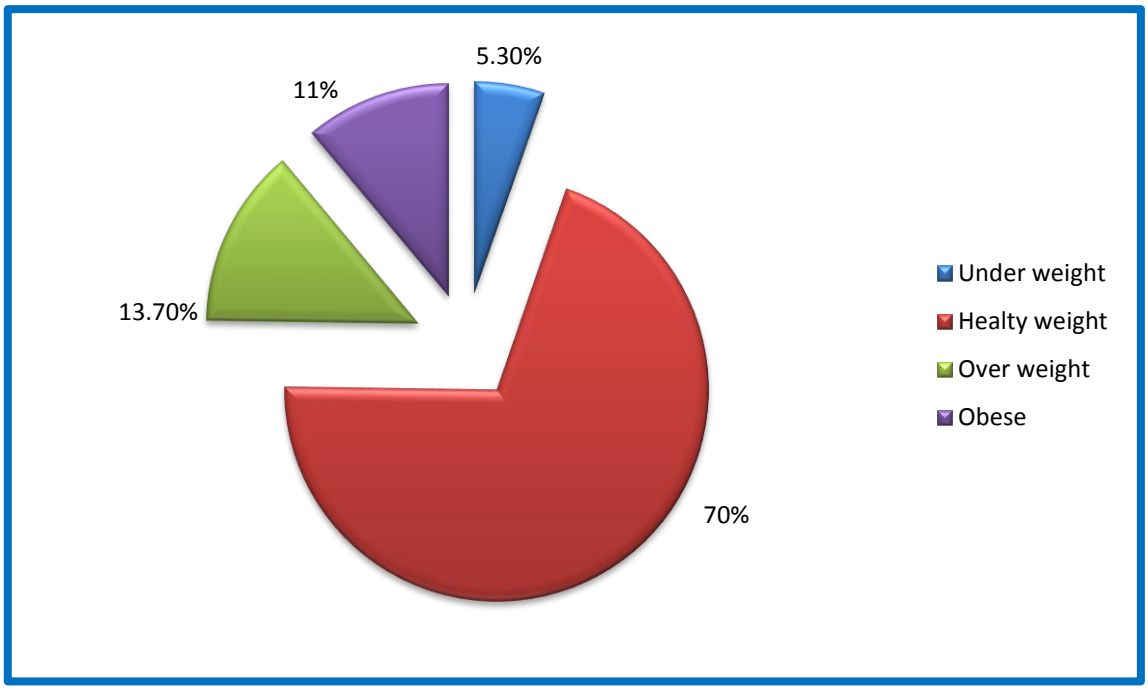

Figure 3: Distribution of the participants according to weight

The prevalence of obese among sample was (11 percent)(equal to greater than the 95th percentile) , (13.7 percent) over weight(85th percentile to less than 95th percentile), (5.3 percent) underweight (less than 5thpercentile) and (70 percent) were healthy weight (5th percentile to less than 85th percentile) (figure 3).

4.3. Dietary pattern:

Table 2: Frequency of consumption of various food items and junk food for adolescent girls

No	Consumption of frequenc food items	Daily		Weekly				Never		Total
				1-2 times /v		3-4times/w				
		N	%	N	%	N	%	N	%	N
1	Milk and dairy product	268	70.5	64	16.8	33	8.7	15	3.9	380
2	Bread and cereal group	376	98.9	1	3	2	5	1	3	380
3	Fruit	207	54.5	126	33.2	28	7.4	19	5	380
4	Vegetable	234	61.6	72	18.9	19	5	55	14.5	380
5	Meat group and substitutes: Fish ,poultry ,red meat	267	70.3	62	16.3	34	8.9	17	4.5	380
	Egg	152	40	133	35	28	7.4	67	17.6	380
	Legumes	29	7.6	190	50	28	7.4	133	35	380
6	Sweets	309	81.3	38	10	25	6.6	8	2.1	380
7	Beverage : Tea ,coffee	178	46.8	61	16.1	4	1.1	137	36.1	380
	Soft drink	153	40.3	120	31.6	19	5	88	23.2	380
	Fruit juice	280	73.7	56	14.7	16	4.2	28	7.4	380
8	Junk food (fried food, burger...etc)	74	19.5	148	38.9	145	38.9	13	3.4	380

The daily consumption of milk and dairy product was 268 (70.5 percent), bread and cereal 376 (98.9 percent), fruit 207(54.5 percent), vegetable 234(61.6 percent), meat 267(70.3 percent), egg 152(40 percent), legumes twenty nine (7.6 percent), sweets 309(81percent),beverage(tea, coffee)178(46.8 percent), soft drink 153(40.3 percent) , fruit juice 280(73.7 percent), and junk food seventy four (19.5 percent) (table 2).

4.4 Nutritional knowledge:

Table 3: knowledge about Macronutrients :

Knowledge	Correct answer		Wrong answer		Total
	N	%	N	%	
Fast source of energy	126	33.2	254	66.8	380
The recommended daily consumption of carbohydrate %	78	20.5	302	79.5	380
The recommended daily consumption of protein %	72	18.9	308	81.1	380
The recommended daily consumption of FAT%	228	60	152	40	380
Fiber source	274	72.1	106	27.9	380

Good knowledge score was noticed in the recommended daily consumption of fat 228 (60 percent) and fiber source 274 (72.1 percent). Bad knowledge score was noticed in fast source of energy 126 (33.2 percent), the recommended daily consumption of carbohydrate seventy eight (20.5 percent) and the recommended daily consumption of protein seventy two (18.9 percent) (table 3).

Table 4 : knowledge about micronutrient :

Knowledge	Correct answer		Wrong answer		Total
	N	%	N	%	
Iodine rich food	316	83.2	64	16.8	380
Iron rich food	195	51.3	185	48.7	380
Caffeine rich food	98	25.8	282	74.7	380
Vitamin C rich food	247	65	133	35	380
Vitamin D rich food	143	37.6	237	62.4	380
Disease caused by Iron deficiency	317	83.4	63	16.6	380
Disease caused Calcium deficiency	356	93.7	24	6.3	380

Very good knowledge score was noticed in iodine rich food 316(83.2 percent), disease caused by Iron deficiency 317 (83.4 percent) and disease caused calcium deficiency 356(93.7 percent). good knowledge score was noticed in iron rich food 195 (51.3 percent) and vitamin C rich food 247(65 percent). Bad knowledge score was noticed caffeine rich food ninety eight (25.8 percent) and vitamin D rich food 143(37.6 percent) (table 4).

Table 5: The others knowledge test:

Knowledge	Correct answer		Wrong answer		Total
	N	%	N	%	
Water need /day	321	84.5	59	15.5	380
water calorie	249	65.5	131	34.5	380
Serving of vegetable	127	33.4	253	66.6	380
Serving of fruit	94	24.7	286	75.3	380

Very good knowledge was noticed in water need /day 321 (84.5 percent). Good knowledge was noticed in water calorie 249 (65.5) percent. Bad knowledge was noticed in serving of vegetable 127 (33.4 percent) and Serving of fruit ninety four (24.7 percent) (table 5).

4.5. Total assessment of general Nutritional Knowledge test scores :

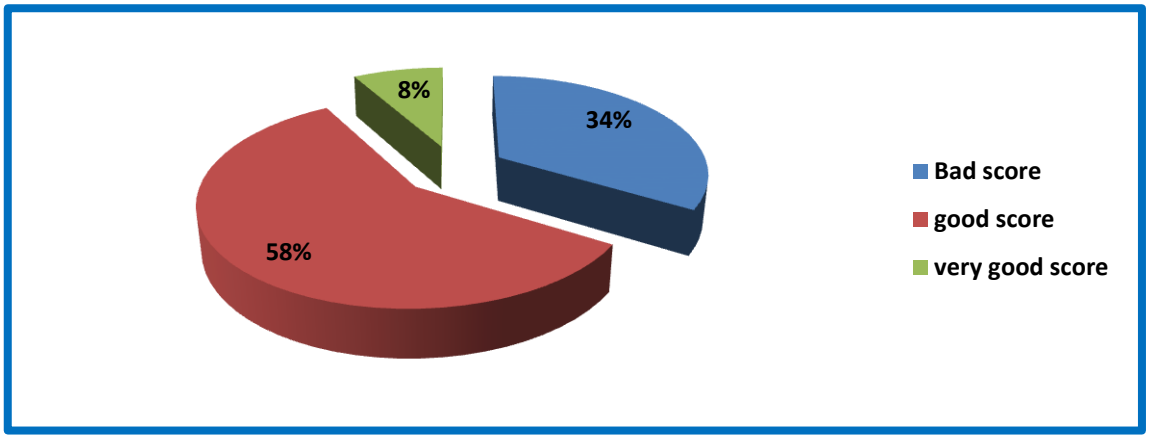

Figure 4 : Distribution of the participants according of their knowledge score

Total NKT scores were 221(58 percent) have a good knowledge score, 128 (34percent) have bad knowledge score then thirty one (8 percent) very good knowledge score (figure 4).

4.6 Relationship between nutritional status and relevant knowledge :

Table 6: Comparison between nutritional status and NKT scores

Score of NKT	Healthy Weight		Unhealthy Weight		Total	%
	N	%	N	%		
Bad score	86	32.3	42	36.8	128	34
Good score	158	59.4	63	55.3	221	58
Very good score	22	8.3	9	7.9	31	8
Total	266	100	114	100	380	100

$X^2 = 0.731^{**}$ (df=2) (P value =0.694)

No statistical significant relationship between BMI categorist (healthy weight /unhealthy) weight and NKT scores (P value =0.694) (table 6).

Chapter 5
Discussion

5. Discussion :

Adolescence is a crucial life stage characterized by dramatic modifications in lifestyle patterns. These modifications include more unhealthy food choices, eating outside the home (mainly at fast food restaurants), sedentary behaviors, and physical inactivity, especially among girls, all of which put adolescents at nutritional risk (Al Faris, 2015)

5.1 Nutritional status :

The BMI classification in these study divided into two groups healthy weight and unhealthy weight to express on the nutritional status of the sample, which result of the current study revealed that more than half 266 (70 percent) normal weight (healthy weight) and 114 (30 percent) unhealthy weight (Figure2). The unhealthy weight 114(30 percent) is further divided to overweight fifty two (13.7 percent), obese forty two (11 percent) and underweight twenty (5.3 percent)(figure 3).

In the comparison prevalence of overweight in the current sample was lower than the report of Arab countries in 2012. The highest prevalence of overweight was reported in Libyan adolescents (26.6 percent), followed by Kuwaiti (20.8 percent), and Syrian (19.7 percent) adolescents respectively. The high prevalence of obesity was (20.6 percent) showed among Kuwaiti adolescents (Musaiger 2012).

These results are not agree with the study conducted in Poland 2011 were found (13.7 percent)of females underweight compared to only (5 percent) among Libyan female adolescent, while only (7.7 percent) were overweight and (1.2 percent) were obese among Polish adolescent female compared to (13.7 percent), (11 percent) respectively among Libyans (Przyslawski 2011).

5.2 Dietary pattern:

This study revealed that most of the students consuming all types of groups of the food pyramid daily (healthy pattern), compared to the most daily consumption of food pyramid groups were found that it is higher than the daily consumption of teenage girls in Iran 2012 , also low consumed of soft drink and junk food except sweets was higher than teenage girls in Iran (Montazerifar 2012).

In this study the results are considered to be good for the daily consumption of basic eating groups that expression as healthy diet pattern like starch groups , milk and dairy product, meat group, fruit and vegetable. On other hand the daily consumption of fast food or empty calorie food that expression as unhealthy diet pattern like sweets 309 (81.3 percent) was highly consumed per day .

Regarding to daily consumption of milk and dairy product 268 (70.5 percent) , bread and cereal 376 (98.9 percent), fruit 207 (54.5percent), vegetable 234 (61.6 percent), meat 267(70.3percent)**,** egg 152(40percent), legumes twenty nine(7.6percent), sweets 309 (81 percent), beverage (tea, coffee) 178 (46.8 percent), soft drink 153 (40.3 percent), fruit juice 280 (73.7 percent), and junk food seventy four (19.5 percent) (table 2).

In general, most of the daily consumption of groups was higher than weekly consumption, except for weekly consumption (1-2 times /w) of legumes 190 (50 percent) was more than daily consumption twenty nine(7.6 percent), as well as weekly consumption (3-4 times /w) of fast food 145 (38.9 percent) was more than daily consumption seventy four (19.5 percent) (table 2).

5.3 Nutritional Knowledge:

The nutritional knowledge in this study revealed that in general good knowledge scores. Total NKT scores were 221 (58 percent) good knowledge ,128 (34 percent) bad knowledge then thirty one (8 percent) very good knowledge (figure 4).

these result was agree with several studies that have good NKT scores (Przyslawski 2011, Thakur 1999, Thanuja 2007) but disagree with a study conducted in Bangladesh 2010 which showed that the overall dietary knowledge was low (Alam 2010).

Although, the Knowledge of the source of fiber 274 (72.1percent), was good knowledge score as well as for the knowledge of recommended daily consumption of fat 228 (60 percent). While the knowledge for fast source of energy 126 (33.2 percent), the recommended daily consumption of carbohydrate seventy eight (20.5 percent) and the recommended daily consumption of protein seventy two (18.9 percent) of the macronutrients was bad knowledge score (table 3).

In addition, the knowledge of micronutrients was generally good for iodine rich food 316 (83.2 percent), disease caused by iron deficiency 317 (83.4 percent) and disease

caused by calcium deficiency 356 (93.7 percent). Good knowledge score was noticed in iron rich food 195 (51.3 percent) and vitamin C rich food 247 (65 percent). But the knowledge score of the source of vitamin D 143 (37.6 percent) and the source of caffeine ninety eight (25.8 percent) was bad score (table 4).

The knowledge of the water need /day 321 (84.5 percent) was very good knowledge score and the calories of water 249 (65.5 percent) was good knowledge score. But the recommended serving for vegetables 127 (33.4 percent) and fruit ninety four (24.7 percent) was bad knowledge scores (table 5).

5.4 Relationship between nutritional status and nutritional knowledge:

In current study, comparison between nutritional status and nutritional knowledge test there was no statistical significant relationship between BMI (healthy/unhealthy weight)and NKT scores (p value =0.694) (P vale > 0.05 no significant) (table 6).

Comparing nutritional knowledge scores among adolescent girls. Which found that healthy weight of sample having bad knowledge score eighty six (32.3 percent), good knowledge score 158 (59.4 percent) and very good knowledge score twenty two (8.5 percent). The sample of unhealthy weight students having bad score forty two (36.8 percent), good score sixty three (55.3 percent)and very good score nine (7.9percent) (table 6).

These result was consistent with two studies conducted in Europe in 2007 and 2011, which showed that there were no relationship between BMI values and NKT scores (Przyslawski 2011,Thanuja 2007). Also agree with study conducted in USA 1999, which revealed that is no significant differences in nutrition knowledge between the obese and non-obese students (Thakur 1999).

Chapter 6

Conclusion & Recommendations

6.1 Conclusion:

The Nutritional status of girls found that (70 percent) of adolescent female Libyan girls was healthy weight of the sample and (30 percent) unhealthy weight, whish considerably a large proportion of unhealthy weight further divided in to underweight(5.3 percent), over weight (13.7 percent), and obese (11 percent).

A large number of adolescents students had a healthful diet pattern and consumed regular healthy foods daily. But the consumption of unhealthy food like sweets daily was very high (81.3 percent) ,the soft drink and junk food were found consumed daily (40.3 percent) and (19.5 percent) respectively.

The Nutritional Knowledge was generally good. Total NKT scores were (58 percent) good knowledge, (34 percent) bad knowledge then (8 percent) very good knowledge.

There was no statistical significant relationship between BMI categorist (healthy weight /unhealthy) weight and NKT scores (P value =0.694), which indicate that the nutritional knowledge was not different between healthy weight and unhealthy weight adolescents.

6.2 Recommendations:

Considering the results of this study, it is suggested that:

1-The nutrition status of adolescent girls in area needs greater attention.

2- Efforts are needed to use the school system favorably for improving the nutritional status of girls.

3- Follow adolescents growth and development evolution through anthropometric data concerning height, weight and body mass index, for assessment of nutritional status through school health program.

4- Health education programs and effective policies are required to promote healthy eating and physical activity and to ensure adequate access to health services.

5- Further studies need to be conducted in order to understand clearly whether the coexistence of underweight, overweight and obesity among adolescent females is related to the influence of socioeconomic conditions, nutritional status, due to cultural and lifestyles, or any other yet unanticipated reasons.

Chapter 7
References

7.References :

Al-Faris N, Al-Tamim J, Al-Jobair M, Al-Shwaiyat N (2015). Trends of fast food consumption among adolescent and young adult Saudi girls living in Riyadh. Food & Nutrition Research ,(59):1-10.

Alkoly T , Asmaa M , Alghamidi A (2011). Nutritional Status and Eating Behaviors among Adolescents of Some Intermediate Schools in Jeddah. JKAU: Med. Sci,18**(** 2):1 -17.

Alam N, Roy S, Ahmed T, Shamsir A (2010). Nutritional Status, Dietary Intake, and Relevant Knowledge of Adolescent Girls in Rural Bangladesh . J HEALTH POPUL NUTR, (1):86-94.

Anand D & Anuradha R (2016). Malnutrition Status of Adolescent Girls in India: A Need for the Hour. International Journal of Science and Research (IJSR),(5):642-46.

Barlow S (2007). Expert Committee recommendations regarding the prevention, assessment, and treatment of child and adolescent overweight and obesity: summary report. Pediatrics,(120) Suppl 4:164 –92.

Barooah P (2012). Adolescents Nutrition, Attitudes and Practices. Basic, Applied and Social Sciences, (2):308-11.

CDC (2009). Centers for Disease Control and Prevention . BMI for children and teens Retrieved , October 10,2013, from http://www.cdc.gov/healthyweight/assessing/bmi/childrens_bmi/about_childrens_bmi.html

Choudhary S, Mishra C, Shukla K (2010). Dietary Pattern And Nutrition Related Knowledge Of Rural Adolescent Girls. Indian J. Prev. Soc. Med,(41):208-15.

Daniels S (2009). The Use of BMI in the Clinical Setting .Pediatrics,(124) Suppl 1:35–41.

Dapi L, Nouedou C, Janlert U, Haglin L(2005). Adolescents food habits and nutritional status in urban and rural areas in Cameroon, Africa. Scandinavian J of Nut, (4): 151-58.

Doustmohammadian A, Keshavarz S, Doustmohammadian S, Abtahi M, Shahani M (2013). Nutritional status and dietary intake among adolescent girls. Journal of Paramedical Sciences (JPS),(4):72-77.

Eisenstein E, Santa K , Cortes S , Auxiliadora M (2000). Nutrition in adolescence. J. pediatr. (Rio J.), (3): 263-74.

Kersting M , Sichert-Hellert W, Vereecken C, Diehl J, Beghin L, Henauw S et al (2008).Food and nutrient intake, nutritional knowledge and diet-related attitudes in European adolescents .International Journal of Obesity, (32): 35-41.
Kotecha P, Patel S,. Baxi R, Mazumdar V, Shobha M, Mehta K , et al (2013).Dietary Pattern of School going Adolescents in Urban Baroda, India. J Health Popul Nutr, (4):490-96.

Krejcie R,& Morgan D (1970). Determining sample size for research activities. Educational and Psychological Measurement, (30): 607-10.

Kuczmarski RJ, Ogden CL and Guo SS (2002). 2000 CDC growth charts for the United States: Methods and development. National Center for Health Statistics. Vital Health Stat ,(246):1-203.

Maiti S, Chattterjee K, Ali K, Ghosh D, Paul S (2011). Assessment of nutritional status of rural early adolescent school girls in Dantan-Ii Block, Paschim Medinipur District, West Bengal. National journal of community medicine, (2):14-18.

Montazerifar F, Karajibani M, Dashipour A (2012). Evaluation of dietary Intake and Food Patterns of Adolescent Girls in Sistan and Baluchistan Province, Iran. Functional Foods in Health and Disease, (3):62-71.

Mukhopadhyay A, Bhadra M, Bose K(2005).Anthropometric Assessment of Nutritional Status of Adolescents of Kolkata, West Bengal. J. Hum. Ecol, (3): 213-16.

Mulugeta A, Hagos F, Stoecker B, Kruseman G, Linderhof V, Abraha et al (2009). Nutritional Status of Adolescent Girls from Rural Communities of Tigray, Northern Ethiopia. Ethiop.J.Health Dev,(1):5-11.

Musaiger A, Al-Mannai M, Tayyem R, Al-Lalla O, Ali E, Kalam F et al (2012). Prevalence of Overweight and Obesity among Adolescents in Seven Arab Countries: A Cross-Cultural Study .Journal of Obesity, 1-5.

Musaiger A(n.d). Arab Center For Nutrition. Retrieved October 30,2013. from http://www.acnut.com

Omobuwa O, Alebiosu CO, Olajide FO, Adebimpe WO (2014). Assessment of nutritional status of in-school adolescents in Ibadan, Nigeria. South African Family Practice, (4):246–50.

Patanwar P & Sharma K (2013). Nutritional Status of Kurmi Adolescent Girls of Raipur City Chhattisgarh, India .International Journal of Scientific and Research Publications, (3): 1-6.

Pinhoa L, Silveirab M, Botelhob A, Caldeirab A(2014). Identification of dietary patterns of adolescents attending public schools. J Pediatr (Rio J),(3):267-72.

Pliego L ,Romero E, Morales L, Garcia J (2016). Dietary patterns associated with body mass index (BMI) and lifestyle in Mexican adolescents. BMC Public Health, (16):1-7.

Przyslawski J, Stelmach M, Grygiel-Górniak B, Mardas M , Walkowiak J(2011). Dietary Habits and Nutritional Status of Female Adolescents from the Great Poland Region .Pol. J. Food Nutr. Sci.,(61): 73-78.

Shaaban S, Nassar M, Abd Elhamid D, El-Batrawy S, Lasheen R(2009). Nutritional Knowledge and Attitude of Adolescent School Girls Living in Cairo. Journal of Medicine and Medical Sciences, (2): 421-27.

Sichert-Hellert W, Beghin L, Henauw S, Grammatikaki E, Hallstro L, Manios Y, et al (2011). Nutritional knowledge in European adolescents: results from the HELENA (Healthy Lifestyle in Europe by Nutrition in Adolescence) study.Public Health Nutrition,(12), 2083–91.

Singh M &Neeta D (2013). Nutritional Status among the Urban Meitei Children and Adolescents of Manipur, Northeast India. Journal of Anthropology,1-5.

Thakur N & Amico F (1999). Relationship of Nutrition Knowledge and Obesity in Adolescence. Family Medicine,(2):122-27.

Thanuja B, Ramya V (2007). Assessment Of Nutritional Knowledge Among Adolescent Girls And Impact Of Nutrition Education. Cauvery Research Journal,(1): 64-66.

Venkaiah K, Damayanti K, Nayak MU, Vijayaraghavan K (2002). Diet and nutritional status of rural adolescents in India. European Journal of Clinical Nutrition, (56): 1119–25.

WHO (2005)World Health Organization. Nutrition in adolescence–issues and challenges for the health sector. Geneva. ISBN 92 4159366 .

Yannakoulia M , Karayiannis D, Terzidou M, Kokkevi A, Sidossis L(2004). Nutrition-related habits of Greek adolescents. European Journal of Clinical Nutrition, 580–86.

Chapter 8
Appendices

8.Appendices:

Appendix (A):

استبيان لدراسة الحالة الغذائية والنمط الغذائي للفتيات المراهقات في بنغازي ومدى معرفتهن بالمعلومات الغذائية

المدرسة ..... رقم التسلسل (.....)

البيانات الشخصية:

1) العمر: 15\ 16\ 17 \ 18 \19

2) السنة الدراسية : أول ثانوي ثانية ثانوي ثالثة ثانوي

3) الدخل الأسري : (أقل من 500\500 -1000\أكثر من 1000)

4) المستوى التعليمي للأب : ابتدائي إعدادي ثانوي جامعي

5) وظيفة الأب :.....

6) المستوى التعليمي للام : ابتدائي إعدادي ثانوي جامعي

7) وظيفة الأم :.....

8) عدد أفراد الأسرة : ( )

9) ترتيب الطالبة في الأسرة : ( )

القياسات الجسمية:

1) الطول :( )
2) الوزن :( )
3) كتلة الجسم : ( )

المعلومات عن الغذاء الصحي :

1- أي من المجاميع الغذائية الآتية تعتبر مصدرا سريعا جدا للطاقة الحرارية (السعرات الحرارية) :

(أ) الدهون (ب) البروتينات (ج) الكربوهيدرات

2 -ما هي النسبة التي يجب أن توفرها الكربوهيدرات من الطاقة الحرارية للإنسان في اليوم :

(أ)15%-20% (ب) 30%-40% (ج) اقل من 60%

3) ما هي النسبة التي يجب أن توفرها البروتينات من الطاقة الحرارية للإنسان في اليوم :

(أ) أقل من 20% (ب) 30% (ج) اقل من 60%

4) ما هي النسبة التي يجب أن توفرها الدهون من الطاقة الحرارية للإنسان في اليوم :

(أ) أقل من 35% (ب)35-40% (ج)أكثر من 40%

5) في أي من الأغذية التالية توجد الألياف الغذائية بكثرة :

(أ) اللحوم بأنواعها (ب) الفواكه والخضروات (ج) الحليب ومنتجات الألبان

6) أياً من الأطعمة التالية تعتبر غنية باليود:

(أ)الخضراوات (ب)الفواكه (ج)السمك

7) أياً من الأغذية التالية يعتبر مصدر غني بعنصر الحديد:

(أ) الحليب (ب) التفاح الأحمر (ج) البقدونس

8) أياً من الأغذية التالية تحتوي على نسبة عالية من الكافيين:

(أ) الشاي (ب) القهوة (ج)مشروبات الطاقة

9) أياً من الأطعمة التالية تعتبر الأغنى بفيتامين ج :

(أ) الحمضيات (ب) اللحوم (ج) الأجبان

10).أياً من الأطعمة التالية تعتبر غنية بفيتامين د :

(أ)الفواكه (ب) الخضروات (ج) الأسماك

11) نقص عنصر الحديد يسب :

(أ) الأنيميا (ب) النقرس (ج)نزيف اللثة

12) نقص الكالسيوم يسبب :

(أ)يؤثر على النظر (ب) ارتفاع الضغط (ج) هشاشة العظام

13) كم يحتاج الشخص من السوائل (المياه) في اليوم الواحد:

(أ) يشرب الماء عند الشعور بالعطش (ب) 5 أكواب فقط (ج) لتر ونصف

14) كم يحتوي ماء الشرب من السعرات الحرارية:

(أ) 20 سعره حرارية (ب) 60 سعره حرارية (ج)صفر

15) عدد الحصص الموصى بها من الخضراوات :

(أ) حصة واحده في اليوم (ب) حصتان في الأسبوع (ج) 3-5 حصص في اليوم

16) عدد الحصص الموصى بها من الفواكه :

(أ) حصة واحده في اليوم (ب)حصتان في الأسبوع (ج) 2-4 حصص في اليوم

Food frequency questionnaire

قائمة الأغذية	يوميا	أسبوعيا		لا يستهلك
		2-1 مرات في الأسبوع	4-3 مرات في الأسبوع	
الحليب كامل الدسم				
الحليب خالي الدسم				
الحليب المركز				
الحليب المجفف				
الجبن بأنواعه				
الزبادي بأنواعه				
الأرز				
المعكرون				
بطاطس مطبوخة				
الكسكسي				
خبز القمح				
خبز الشعير				
الخبز الشامي				
التو ست				
الفشار				
الفواكه				
الخضروات				
العصائر				
اللحوم الحمراء				
الدجاج				

قائمة الأغذية	يوميا	أسبوعيا		لا يستهلك أبدا
		2-1 مرات في الأسبوع	4-3 مرات في الأسبوع	
الأسماك				
التونة				
بيض مقلي				
بيض مطبوخ				
الفاصوليا				
العدس				
الحمص				
الفول				
المكسرات				
الشاي				
القهوة				
النسكافيه				
المشروبات الغازية				
الشوكولاتة				
الحلويات				
الكيك				
الكعك				
المعجنات				
المقليات				
البرجر				
الشاورما				

Appendix (B):

Electronic balance scale

Tape measur

Appendix (C):

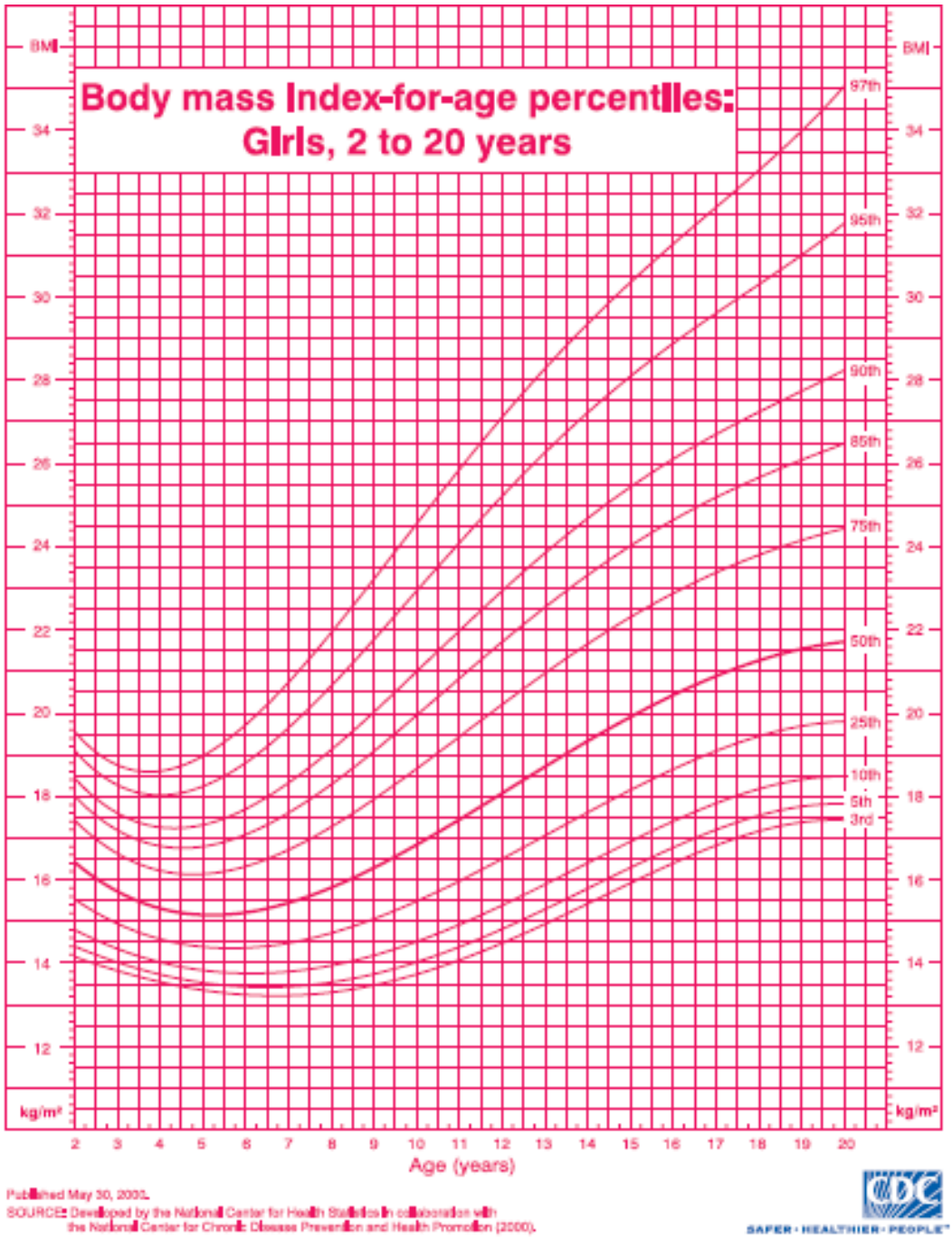

Figure 14. Individual growth chart 3rd, 5th, 10th, 25th, 50th, 75th, 85th, 90th, 95th, 97th percentiles, 2 to 20 years: Girls body mass index-for-age

Chapter 9
Abstract in Arabic Language

الحالة الغذائية والنمط الغذائي للفتيات المراهقات في بنغازي ومدى معرفتهن بالمعلومات الغذائية

إعداد

صباح صالح محمد

المشرف

د فاطمة بن خيال

الملخص

المقدمة:يسهم الوضع التغذوي للمراهقات وأمهات المستقبل إسهاما كبيرا في الحالة التغذوية للمجتمع.**الأهداف:** تقييم الحالة الغذائية والنمط الغذائي ومعرفة العلاقة بين الحالة الغذائية للمراهقات ومدى معرفتهن ببعض المسائل الغذائية. **طريقة البحث:** أجريت دراسة مقطعية تضم 380مراهقة من الفتيات في المدارس الثانوية لمدينة بنغازي اللواتي تتراوح أعمارهن بين 15و19 سنة لتقييم الحالة الغذائية عن طريق قياس الطول والوزن و مؤشر كتلة الجسم والنمط الغذائي واختبار المعرفة بالغذاء الصحي باستخدام استبيان معد لذلك. **النتائج:** نسبة انتشار السمنة بين العينة كانت (11 في المائة) و (13.7 في المائة) وزن زائد و (5.3 في المائة) نقص الوزن و (70 في المائة) وزن صحي. وبلغت نسبة الاستهلاك اليومي من الحليب ومنتجات الألبان(70.5 في المائة) والخبز والحبوب(98.9في المائة) و الفواكه (54.5 في المائة) الخضروات (61.6 في المائة) واللحوم(70.3 في المائة) والبيض (40 في المائة)والبقول (7.6 في المائة) والحلويات(81 في المائة) والشاي والقهوة (46 في المائة) والمشروبات الغازية (40.3 في المائة) وعصير الفواكه (73.7 في المائة) والوجبات السريعة(19.5 في المائة). مجموع معدل اختبار المعرفة الغذائية كان بمعدل جيدة(58في المائة) ومعدل سيئ (34 في المائة) ومعدل جيد

جدا(8 في المائة).**الاستنتاج:** عند تقييم الحالة الغذائية للفتيات وجد أن حوالي (30 في المائة) وزن غير صحي, وهي تعتبر نسبة كبيرة. وجد أن عددا كبيرا من المراهقات لديهن نمط غذائي صحي, وكان لديهن استهلاك يومي للمجموعات الأساسية من الهرم الغذائي. ولكن الاستهلاك اليومي للأغذية الغير صحية كان مرتفعا جدا مثل الحلويات (81.3 في المائة). لا توجد علاقة ذات دلالة إحصائية بين مؤشر كتلة الجسم و اختبار المعلومات الغذائية. يجب تكثيف برامج التثقيف والتوعية الصحية لتعزيز الأكل الصحي والنشاط البدني.

الحالة الغذائية والنمط الغذائي للفتيات المراهقات في بنغازي ومدى معرفتهن بالمعلومات الغذائية

قدمت من قبل :

صباح صالح محمد صالح

إشراف :

د. فاطمة صالح بن خيال

قدمت هذه الرسالة استكمالا لمتطلبات الحصول على درجة الماجستير في التغذية.

جامعة بنغازي

كلية صحة العامة

مارس 2018