Nutrition and Cholesterol Status of Young Adults in A Selected Area of Dhaka City

SM Rasel Faruk*

Department of Nutrition and Food Science, University of South Asia, Banani, Dhaka, Bangladesh

***Corresponding Author:** SM Rasel Faruk, Department of Nutrition and Food Science, University of South Asia, Banani, Dhaka, Bangladesh.*

Abstract

Introduction: Nutrition is a basic human need. Foods supply nutrients, which is a prerequisite for healthy life and living. A proper diet is essential for growth, development and to maintain healthy and active life. Food consumption depends upon availability of food items either through production and or import according to demand and availability of resources and needs. Apart from supplying nutrients, foods provide a host of other components which have a positive impact on health and a delineation may bring forth many diseases either short term or long term.

The balance between nutrient intake and nutrient requirements is influenced many factors like food intake, economic condition, eating behavior, emotional environment, disease, culture pattern, absorption, infection, fever or physiologic stress, growth, body maintenance and wellbeing, psychological stress etc.

Objective: To assess the effect on nutritional status of a group of young adults of TGTDCL in order to advise them on, how to improve their health and nutritional status for not to be a victim from diseases. To improve the quality of life to make the young adults more conscious about the bad effect of cholesterol.

Materials and Method: The study was carried out among the executives and non-executives of TGTDCL, Dhaka from September to December 2013. The total number of Study subjects were 111 male and female.

I prepared one standard questionnaire to find out nutritional status, Socio economics condition. The age, anthropometrical measurements as well as food habit of the respondents. Each respondent was asked to give a test/sample of blood, anthropometrical data: height, weight, BMI, Biochemical findings to assess cholesterol status, education, blood pressure. Informed consent forms each subject was taken after explaining the purpose of the study. I requested the young adults who were willing to participate. After collection data, a PC was used to entry and by using SPSS, I analyzed data. The tables and charts were generated for presentation.

Result and Discussion: Among all the executives 0% of them were under weight, 63.15% executives had normal BMI about 5.55% non-executives were under weight, 61.1% had normal BMI (Table 1).

26.3% executives had normal blood cholesterol level where as 50% non-executives had normal blood cholesterol level. High blood cholesterol level found more among the executives which was 31.57% compared to non-executives (22.22%, Table 2).

Among the respondents according to sex there was no underweight case from the executives. About 66.66% female respondents had normal BMI comparing to their male colleagues, who were 61.5%. Overweight was found about 38.5% in male respondents, whereas 16.66% female were overweight (Table 4).

Overweight among the non-executives were similar (about 33.34%) both in male and female colleagues. About 6.66% male non executives were underweight (Table 5).

Regarding blood pressure, only 16.3% respondents had hypertension and 83.7% were normotensive (Figure 2).

Regarding vaccination; 83.7% respondents completed EPI vaccination but 16.3% were non or partially vaccinated (Figure 3).

Regarding food habit 36% respondents liked mixed food of all types. 33% respondents liked protein rich food. 21% respondents liked only vegetable (figure 4).

About 26.3% executives had normal blood cholesterol level. 42.1% executives had borderline high cholesterol level and 31.5% executives had high blood cholesterol level.

But 50% non-executives had normal blood cholesterol level. 22.22% non-executives had high blood cholesterol level. So, high blood cholesterol level is common among the executives comparing to non-executives (figure 5).

Regarding BMI, underweight and overweight were same (about 2.7%) among all the respondents. About 62.17% respondents had normal BMI (Figure 6).

Conclusion: Bangladesh is now running fast for the education of its population. Education is becoming the first priority for most of the families after food and shelter. Executives are well educated compared to non-executives.

In my studies I found that there was no underweight case from the executives. Most of the officials had normal BMI. Non executives had normal blood cholesterol more than executives. High blood cholesterol found more among the executives compared to non-executives.

Female executives were more conscious about weight control. They had normal BMI more than their male colleagues. I found that 6.66% male non executives were under weight.

Overall 32.43% respondents had overweight. Still now 16.3% respondents had no or partial vaccination.

About 36% respondents liked mixed food. Protein rich food liked by 33% respondents. Most of the respondents had normal blood pressure, 16.3% had hypertension.

Recommendation: Nutritional status of the respondents was fine but overweight and high blood cholesterol is prone due to lack of physical activity and proper nutritional education. Food habit should be changed with balanced diet intake. Awareness should be built up regarding physical exercise.

Keywords: Nutrition; Cholesterol; Adults; Dhaka

Introduction

Malnutrition is a widespread public health problem in developing countries. According to FAO,2002,799 million people in the developing world were chronically undernourished in 1998- 2000. Even more people are debilitated by poor nutrition and vitamin A, iron, iodine deficiency [1]. Although adult nutritional status can be elevated in many ways, the BMI is most widely used because its use is inexpensive, noninvasive and suitable for large scale surveys. Therefore, BMI is the most established anthropometric indicator used for assessment of adult nutritional status [2]. BMI is generally considered as a good indicator of not only the nutritional status but also the socioeconomic condition of a population, especially adult population of developing countries [3,4]. Poor nutrition adversely affects an individual's physical and mental development, productivity and the span of productive years. Thus, significantly influencing the social behavior and economic potential of man. This problem is most prevalent among the vulnerable sectors of the population particularly those residing in socio economically depressed urban and rural areas [5]. Nutritional status among adolescents with no or low education have lower BMI than the more well educated adolescents. An improvement in BMI value is documented among both rich and poor adolescents [6]. Food items rich in micronutrients are costly, thus discourage consumption and contribute towards micronutrient deficiencies experienced by the elderly. The societal changes and worldwide nutrition transition are driving the obesity epidemic, thus raising the BMI which also increase the risk of developing type2 diabetes mellitus, cardiovascular disease, reduces the life expectancy, cancer of breast, colon, prostate, kidney, gall bladder and osteoarthritis, a major cause of disability and one of the key risk aspects for other chronic diseases collectively with smoking, high blood pressure and high blood cholesterol [7]. Blood pressure increases with age since the arteries become stiffer and consequently high blood pressure is a very frequent pathology in the elderly [8]. However, the more the arteries become stiffer, there is maximal blood pressure causing the systolic pressure increases compared to the minimal diastolic pressure, which involves an increase in the difference, which is the pulse pressure. Hypertension is therefore, one of the major risk factors for coronary heart disease in the elderly [9]. Poor nutritional status is a principal concern for elderly and nutritionally insufficient diets can contribute to or exacerbate chronic and acute diseases and these hasten the advancement of degenerative disease associated with aging [10]. Plasma lipoprotein levels are major modifiable risk factors for cardiovascular disease. Increased levels of atherogenic lipoproteins, especially LDL, but also IDL and possibly chylomicron remnants, contribute to the development of atherosclerosis. Increased plasma concentration and reduced diameter favor sub endothelial

accumulation of these lipoproteins. Cholesterol laden cells release cholesterol to HDL for reverse cholesterol transport to the liver for excretion. HDL may also counter act some components of the inflammatory response, such as the expression of vascular adhesion molecules by the endothelium. Consequently, low HDL cholesterol levels also predispose to atherosclerosis. Lipid measurement are usually performed for the following reasons: screening for primary or secondary prevention of cardiovascular disease, investigation of patients with clinical features of lipid disorders and testing relatives of patients with one of the single gene defects causing dyslipidaemia [11].

Food, water and oxygen are life-sustaining substance essential to human life. Food provides both energy and the material needed for body cells [12].

Nutrients are nourishing substances in food. These are needed for growth and development from childhood to entire life cycle for maintenance of body functions.

Chemical composition of human body

Water - 73%
Protein - 17%
Fat - 12%
Salt - 7%
Carbohydrate - 1%

Table a

The chemical composition of human body is exactly the ads that human eats everyday but none of the single food can supply all nutrients, the body needs.

Nutrient	Cereal	Vegetables and Fruits	Milk	Fish/ Meat	Total Food
Protein	Protein	-	Protein	Protein	Protein
Fat	-	-	Fat	Fat	Fat
Carbohydrate	Carbohydrate	-	-	-	Carbohydrate
Fiber	Fiber	-	-	-	Fiber
Thiamin	Thiamin	Thiamin	-	Thiamin	Thiamin
Riboflavin	Riboflavin	Riboflavin	Riboflavin	Riboflavin	Riboflavin
Niacin	Niacin	-	-	Niacin	Niacin
Folacin	Folacin	Folacin	-	Folacin	Folacin
Vitamin-B_{12}	-	-	Vitamin-B_{12}	Vitamin-B_{12}	Vitamin-B_{12}
Vitamin-C	-	Vitamin-C	-	-	Vitamin-C
Vitamin-A	-	Vitamin-A	Vitamin-A	-	Vitamin-A
Vitamin-D	-	-	Vitamin-D	-	Vitamin-D
Iron	Iron	Iron	-	Iron	Iron
Calcium	-	-	Calcium	-	Calcium
Zinc	Zinc	-	Zinc	Zinc	Zinc
Magnesium	Magnesium	Magnesium	Magnesium	Magnesium	Magnesium

Table b

Malnutrition is a state in which a prolonged lack of one or more nutrients retards physical development or causes specific clinical disorders e.g. iron deficiency anemia, goiter, etc.

Malnutrition can also be defined as an impairment of health resulting from a deficiency, excess of nutrients. It includes under nutrition and over nutrition [14].

Some characteristics of people suffering from malnutrition are dull life, less hair, greasy pimpled facial skin, dull eyes, slumped posture; fatigue and depression. These are easily evident by their spiritless expression, behavior and lack of interest in their surroundings. Such people may be under weight or overweight sleepiness may be occurring. Constipation is a common problem.

The problem of malnutrition cannot be taken lightly as it may sometimes prove fatal. It may also cripple a person for the whole life [15].

A disease which results from lack of a certain nutrient is known as a deficiency disease.

Malnutrition results in most of us since we do not meet to our body's requirements. Also, malnourished people are prone to continuous bouts of some illness of the other which affects their work very often. This condition can be easily set right if we eat the right food in the right amount daily, i.e. if we consume a balance diet every day and develop good eating habits for good health [16].

But during eating all essential nutrient requirement for particular age, sex, physical activity and also liking and disliking. Malnutrition may affect nutritional state of the individual, resulting kidney and heart disease. And for that matter this present study was conduct.

The Nutrients of food, which must be supplied by the diet to produce and maintain optimum health, belong to the broad groups of carbohydrates, proteins, fats, vitamins and minerals.

Figure a: Factors Influencing Human Nutrition.

Dietetic management concern a minimum of 1600-2000k. cal is necessary. A higher calorie intake of carbohydrates and fats is desirable. All foods containing proteins are stopped if the patient is under conservative treatment and the blood urea nitrogen is rising.

A daily minimum of l00g CHO is essential to minimize tissue protein breakdown. This would require 2 liters of 5% intravenous glucose; higher concentrations produce venous thrombosis. Since the fluid intake in acute renal failure is to be limited, it is best to give oral feeds of 700 ml of 15% glucose solution made palatable with lime juice. If the patients cannot fed by mouth a nasogastric tube is passed and glucose or dextrimaltose administered. Total fluid permitted is 500 ml plus the total losses through the urine and the gastrointestinal tract.

Operational Definition

Respondents: The people who were interviewed called the respondents. They were 25-45 years aged office executives and non-executives.

Nutrition: Nutrition is the science of food, the nutrients and the substances there in, their action, interaction and balance in relation to health and disease and the process by which the organism ingests, digests, absorbs, transports, utilizes and excretes food substances.

Malnutrition: An impairment of health resulting from a deficiency, excess or imbalance of nutrients.

Food: It is a composite mixture of substances which when consumed performs certain function in the body.

Knowledge: Knowledge means those items of fact and procedure by which and individual learns what to do in a given situation and enough about why it is done to make the procedure meaningful in or far as he or she is able to understand it.

Nutrient: Chemical substance in foods which nourishes, e.g. amino acid, fat, calcium.

Body mass index: Body mass index (BMI) is the ratio of one dimension with three dimension volume tissues. Weight is considered as three dimensional tissues. By contrast, height is one dimensional. Body mass index in adult is calculated by the following method

Nutrition education: Nutrition education is the specialized health education program aiming at general improvement of the nutrition status of an individual or a group of individuals to adopt health and dietary practices through various learning processes throughout different stages of life.

Balanced diet: A balanced diet is one which includes all the nutrients in correct proportion or adequate amounts to promote and preserve health.

Calorie: A unit of heat measurement, in nutrition, the kilocalorie is the amount of heat required to raise the temperature of 1 kg water through l0 C.

Atherosclerosis: The most common form of artery disease characterized by plaques along the inner walls of the arteries. It is a progressive inflammatory disorder of the arterial wall that is characterized by focal lipid rich deposits of atheroma that remain clinically silent until they become large enough to impair arterial perfusion.

Anthropometry: Branch of anthropology dealing with comparative measurements of the parts of human body.

Systolic pressure: The first figure in a blood pressure reading, which represents the arterial pressure caused by contraction of the left ventricle of the heart.

Diastolic pressure: The Second figure in a blood pressure reading which represents the arterial pressure when the heart is between beats.

Research: Research is a term which is applied to find out the knowledge gap to improve the system.

Sample Size: The number of individuals is called sample size.

Population: Collects data on a sample from a much large group of individuals, called population.

Prevalence: Prevalence is a term which represents the burden of disease at a particular time rather than the chance of future disease.

Cross Sectional study: Study which is carried out at just one point in time or over a short period of time (i.e; It is conducted by only one time interview).

Young/Prime adult: A person in the age range of 20-40 [30].

Midlife Transition: Young Adulthood, first adulthood, draws to its close "Midlife Transition| from roughly age 40 to 45 [31].

Second Adulthood: After midlife transition second adulthood begins [32].

Executive: The person who is highly educated and his/her salary status is above or equal grade 10 (According to Bangladesh government service rule).

Non-executive: The person who is not so highly educated and his/her salary status is below grade- 10 (according to Bangladesh government service rule).

Key Variable

1. Age of the respondents.
2. Education of the respondents.
3. Job status
4. Anthropometrical measurements of the respondents.
5. Conception about nutrition of the respondents.
6. Vaccination against EPI
7. Food habit

Literature Review

History

Food is basic requirement of man than even shelter and clothing. It is a source of nutrient and provides the energy required for all activities of a human body, as growth, repair of the damaged tissues, reproduction and sustenance [16]. Food is consumed to satisfy primarily hunger, which is an unpleasant sensation, hunger is a physiological condition associated with the contraction of the stomach and leads to other sensations such as weakness, irritability and even nausea. Food is also sought to satisfy the appetite, a pleasant sensation causing a person to satisfy the craving of the body or food. It is more of a psychological state usually felt in the mouth depending on odor and flavor as well as the memory of a pleasant food. Satiety is the feeding of having had enough of the desired food, after eating it. Apart from being a source of nutrients and energy, food also gives a sense of security in the sense those individuals, communities and nations feel secure when enough food is stored to meet the requirement during scarcity periods.

Basic needs of food

Food is the topmost priority of life and living also very important because it maintains growth and development for life [17].

From the beginning, scientists were serious about the food they consumed, it's passage in the body and its effects. This curiosity led to the development of the science of nutrition. Nutrition is defined as the scientific study of food and its relation to health. It can also be defined as the science, which deals with those processes by which body utilizes food for energy, growth and maintain health.

Food of proper nutritional value, hygienic in quality and appropriate in quantity is essential for good health and active life. The nutrients of food, which must be supplied by the diet to pro-

duce and maintain. Optimum health belongs to the broad groups of carbohydrates, proteins, fats, vitamins and minerals. In order to supply our daily food requirements, we must have a suitable intake of these nutrients and hence body will get a balance diet. This contains various groups of food stuffs such as energy yielding food (Carbohydrates and fat sources), body building foods (protein source) and protective foods (minerals and vitamin sources) in correct proportion so that an individual is assured of obtaining the minimum requirements of all the nutrients.

Choice of foods and eating habits of young people

Food habit is an important factor in food acceptance and consumption. It is defined as culturally standardized set of behaviors in regard of food manifested by individuals who have been reared within a given cultural tradition [18]. The cultural tradition of a population itself is non static cultural tradition involves with changing time to include newer food and exclude older ones. Rural migration, technological advancement, flow of food information, newer foods and food products in the market etc. are all contributory to the overall evolution process. As a result, people's attitude and values on food and nutrition is always in a process of gradual change to influence their food habits.

Food Choice and eating habit

Every people want the inception of something new in his lifestyle, which make his daily life easier and dynamic. The life style of the urban people in changing rapidly. They become easy day by day. They want something change in their regular dietary intake, which will save their time, energy and money. In their busiest lifestyle they do not think rational to spend much time in making food [19].

Changing Food habits

In many countries the current staple foods are not the same as those eaten even a century ago. Food habits and customs to change and they are influenced in many different ways. Usually foods habits differ most widely, in regard to which foods of animal origin are liked disliked eaten or not eaten in a society. A number of food habits and practices are poor from a nutritional persist of view. First wider range of time is used for breakfast, lunch and dinner especially among the younger generation. In general, dinner times have become late. The younger the more skip breakfast. Further 70% of the people eat some snacks between meals and young people account for a large part of this trend. The peak time for snacks is 11.00 am 3.00 pm and 8.00 pm, but the overall time for snacks ranges from early morning until late night (Fukuba 1990) [20].

Now days the city's fast food shops provide a wide variety of food items. In general, most of the F.F that foods are popular high energy content as well as salt. High energy usually comes from high amount of fat and sugar used as in gradients. As cholesterol is an animal fat, these fat foods provide huge amount of cholesterol to urban people and makes them susceptible to disease of circulating system moreover, in developing countries like Bangladesh the changing food habit culture is associated with the disadvantages including poor hygiene and poor quality food.

The consequences of the changing food behavior culture and hence new way of dietary life may be found contributory to a sleep rise in diet, reputed non communicable disease, obesity, certain cancers, stroke, diabetes and other diseases in many developing countries (Fernundo., *et al*. 1970) [21].

Most of us wish a long life but not like to think of ourselves as suffering poor health when we are old. We can truly enjoy a long life if we are productive and free of illness, rather than suffer from heart disease, stroke, diabetes and other chronic disease. We should strive to be as free from disease as possible and to enjoy vitality even in the life. The best way to promote your health and prevent chronic diseases in the future is to observe the following guidelines:

1. Eat a healthful balanced diet
2. Drink plenty of fluid
3. Exercise
4. Get adequate sleep
5. Limit stern or adjust to the causes of sterns.
6. Consult health care professionals on a regular basis.

Eating is a pleasure. Eating well is also a means to good health. Most of us want a long, productive life, free from illness. Yet many people from early middle age on ward suffer from heart diseases, strokes, diabetes, and kidney disease. We can slow the development of and in some cases even prevent these diseases by pursuing a diet that works against them. This action most profitable if begun early and continued throughout adulthood [22].

Our current day-to-day health practices can significantly influence our future health. Although genetics does play a role in many health problems that occur with age are not inevitable, they result from disease processes. We take food and oxygen and we give out wastes (end products of metabolism) as solids, liquids and gases.

Food habit changes invite many diseases. Malnutrition, mental stress also created many problems. In this study I tried to know the effect of dietary habit on nutritional status of young adult executives and non-executives with their cholesterol level.

Dietetic Management:

Calories: A minimum of 1600-2000 k.cal (6.7-8.4MJ) is necessary for an individual. A higher calorie intake of carbohydrates and fats is desirable.

Proteins: A normal individual should take at least 10% of his/her energy intake from protein but not more than 15%.

Fats: A person should take 30% of total energy from fat and upper limit of dietary cholesterol intake 300 mg/day. Fat in the diet should not be more than 80 g/day [23].

Carbohydrates: There are two types of carbohydrate-
(i)Digestible (ii) Undigestible carbohydrate. One should take at least 40 gm of dietary fiber daily.

Minerals: Calcium, Phosphorus, Iron, Magnesium are major minerals required for body.

Electrolyte:
- o   Average sodium intake may be as high as 20 g/day.
- o   Daily requirement of iodine is reported to be 100-150gm
- o   Copper intake may be 2-3 mg/day.
- o   Vegetarian food is probably adequate to meet the daily re quirement of potassium.

Fluid: Total fluid permitted is 500 ml plus the total losses through the urine and the gastrointestinal tract with insensible loss.

The increased vulnerability of non-communicable disease (NCD) of developing population experiencing a demographic and epidemiological transition increased risk of NCD at a time when the battle against infectious disease is ongoing for the first time in history, analyses show that NCD now constitute a more significant contribution to ill health throughout, the world than do infectious diseases [24]. The emergence of NCD is significantly associated with changes in dietary pattern in most of the countries. According to WHO estimates, major NCDS today are responsible for at least 40% of all deaths in developing countries and 75% in industrialized countries, where coronary heart diseases (CHD) is the first cause of mortality [25]. South Asian migrants (Bangladesh, India, Pakistan and Srilanka) have the highest incidence of CHD among all ethnic groups in the world [26]. It is the concern of many health professionals that, in Bangladesh, NCD might replace infectious disease as the primary cause of morbidity and mortality.

High blood pressure enhances the development of arteriosclerosis and other disorders. Hypertension causes the heart to work harder, Persons who are aware of their hypertension should take medication as prescribed, eliminate excess sodium from their diet and maintain an optimal body weight, However, many college students may not know that they have hypertension [27].

Health related risk factors
1.   Hypertension
2.   Obesity
3.   Diabetes mellitus
4.   Hyperlipidaemia
5.   Smoking
6.   Family history
7.   Dietary factors
8.   Personality

Dietetic Management
- o   **Energy:** Loss of weight results in reducing the load on heart. Usually a 1000-1200 kcal diet is suitable for an obese patient in bed [28]. Those who are normal for their weight are advised a maintenance diet until, convalescence is complete, and they return to their normal activity.

- o   **Carbohydrates, Fats, Proteins, Vitamins and Minerals:** These must be adequately provided. CHO should be given in the complex form. Fat should be derived more from oils containing high amounts of PUFA. Vitamins and Minerals should be as per their daily requirements.

- o   **Sodium:** A sodium-restricted diet is recommended whenever there is retention of sodium in the body along with fluids. Generally, Na may be permitted in amount of 20 gm per day. A further reduction may not be required if the patient is being given diuretics.

- o   **Fluid:** Restriction of Fluids may not be necessary in most cases. Hence an intake of up to two liters of fluids per day may be allowed. In severe congestive heart failure in spite of treatment with diuretics, if fluid retention in the body is seen, then restriction of fluid intake may be introduced [29].

Anthropometrical Measurements

Anthropometrical measurements are measurements of body size and composition. This information is needed for assessing nutritional status and for planning diets. Height, weight and skin fold thickness are anthropometrical measurements that are frequently obtain collecting measurements such as height and weight over a period of time is particularly useful in assessing growth. Various body circumferences such as mid arm circumference, head circumference provide useful data about muscle mass, brain growth and fluid retention respectively. Close attention needs to be paid to following proper technique when obtaining each of these measurements. For the measurement to be meaningfully compared to reference standards they must be obtained in the manner prescribed for the reference's standards used.

Height and weight

Height and weight, two of the most important parameters of nutritional status provide information about body size that is critical for monitoring care and for estimating nutrient requirements. It is therefore, particularly important that collected information's are recorded accurately. The value of obtaining an accurate initial height and weight deserves special emphasis because these data are missing from the medical records of a substantial number of clients.

Measurement of Blood Pressure

Blood pressure is measured by means of sounds created by turbulent flow of blood through a constricted artery.

Blood pressure was measured by sphygmomanometer and a stethoscope.

An inflatable rubber bladder writhing a cloth cuff is wrapped around the upper arm and a stethoscope is applied over the brachial artery. The artery is silent before inflation of the cuff because blood normally travels in a smooth laminar flow through the interterm laminar means layered blood in the center stream moves the fastest and blood flowing closes artery wall moves more slowly. This smooth flow not produces vibrations that create sounds.

When the artery is pinched however, blood through the constriction becomes turbulent cause artery to vibrate and produce sounds. The ability of pressure to constrict the artery is opposed by the pressure. In order to constrict the artery, then the pressure must be greater than the diastolic blood pressure. If the cuff pressure is also greater than the systolic blood pressure, the artery will be pinched off and silent. Turbulent flow and sounds produced by vibrations of the artery as a result of this flow occur only when the cuff pressure is greater than the diastolic pressure and less than the systolic pressure.

Suppose that a person has a systolic pressure of 120 mm Hg and a diastolic pressure of 80 mm Hg (the average normal valve) when the cuff pressure is between 80 and 120 mm Hg the artery will be closed during destitute and open during systolic.

Objectives of the study
General objective

To assess the effect on nutrition and cholesterol status of young adult executives and non-executives in order to advise them on how to improve their health and nutritional status for not to be a victim from diseases. To improve the quality of life to make the young adults more conscious about the bad effect of cholesterol.

Specific Objectives

o   To find out the demographical and socio-economical characteristics of the study population.

o   To determine the food habit and how food affect their blood cholesterol level.

o   To find out of nutritional status of the study population through measurements of height and weight.

o   To find out the status of the study populations blood pressure and cholesterol level.

o   To recommend appropriate measures to prevent any related conditions.

Materials and Methods
Formulation of study questionnaire

After selection of the subject first assignment was to prepare questionnaire as to achieve the objectives. The questionnaire was designed in such a way that the required items would be known easily. My subject was "Nutrition and cholesterol status of young adults of Titas Gas Transmission and Distribution company limited" to find out the nutritional status, job status, age, religion, food preference, blood pressure, education, vaccination and cholesterol status of the respondents.

Study design

It was a cross-sectional study.

Nutrition assessment techniques are

1. Dietary data
2. Anthropometrical measures
3. Physical examination
4. Blood sample study.

Selection of the study location

The study was carried out among the employees of Titas Gas Transmission and Distribution Company Limited, Dhaka with permission from the authority and by taking informal consent.

Study Period

The study was carried out from September to December 2013.

Sample size calculation

From many calculation formula I have decided to go through the following formula;

$$n = z^2 \times \frac{p\,(1-p)}{d^2}$$

Where;   n = require sample.
z = Standard normal deviated set at 1.96 compounding to 95% confidence interval.
p = prevalence rate which set at 30% proportion when p is unique.
d = admissible error set at 0.05

and the study was conducted among 111 young adult executives and non-executives.

Collection of data

The selected 111 respondents were requested to help in following up the questionnaire. I asked each respondent separately. After collecting all the data, they were organized sequentially according to the individual questions of the questionnaire possible connections were found out among them. Then tables and charts were generated to prepare graphical presentation.

Assessment of Nutrition Status

Nutritional status is the assessment of condition of health of an individual as determined by the nutrients the body receives and utilizes. Nutritional status expresses the degree, which physiologic needs of nutrients are being met balance between nutrient intake and nutrient requirements is influenced many factors like food intake, economic condition, food habit.

Dietary Data

Malnutrition can be detected by analyzing the combined findings from a number of assess techniques. One method of evaluating nutrition status is to obtain information about a person's diet. By asking Òwhich food you like most" I tried to know about respondent's liking and disliking.

Anthropometrical Measures

A second technique that may reveal nutrition problems is the taking of anthropometrical measures such as height and weight.

Physical examination

A third nutrition assessment technique is a physical examination that looks for clues to poor nutrition status. Every part of the body that can be inspected can offer such clues, the hair, eyes, skin, tongue and others This technique can detect evidence pointing to deficiencies, imbalances and toxicity status.

Cholesterol Determination

To determine cholesterol status a "Easy mate CGU (Suitable for invitro diagnostic use from Taiwan) was used.

Procedure

1. With all septic precaution a finger prick was done of the subject.
2. A drop of blood was put on the side of the test strip target area.
3. The blood was absorbed and the targeted area turned into red.
4. The testing reaction started when the meter beeped.
5. After 150 seconds the meter showed the result on the screen, which was expressed in mg/dl.

Anthropometrical data collection

o **Body weight:** A Detector Scale was used to record body weight of the study respondent. The balance was standardized every day before use. Body weight was taken barefooted, light clothing and average of 3 reading was recorded.

o **Height:** Height of the study respondent was measured barefooted in the standing position in a Detector scale, graduated in cm.

o **Data Analysis:** After collecting the data they were coded, edited and entry into PC. The answer was processed by Microsoft Excel using SPSS software. The result was presented in tables and graphical presentation. Data were analyzed in terms of frequency distribution, percentages, mean and standard deviation.

Limitation of the study

1. I completed the study and submitted the dissertation papers with in specified time, with very limited financial support and lack of adequate availability of literature on the subject is a great limitation.

2. The study was conducted in only one urban sitting.

3. The respondents did not fully co-operate.

4. I had no per-experience about this type of work and thus faced a lot of problems during the whole work study.

5. All of the respondents did not participate in the study due to their panic to give the blood specimen.

Results

Table 1 shows that among all the non-executives 5.55% were under weight, from all the executives 5.26% were obese.

	N	BMI			
		Under weight (<18.5) n (%)	Normal (18.5-24.9) n (%)	over weight (25-29.9) n (%)	Obese ≥ 30 n (%)
Executive	57	0 (0%)	36 (63.15%)	18 (31.57%)	3 (5.26%)
Non execution	54	3 (5.55)	33 (61.1%)	18 (33.33%)	0 (0%)

Table 1: Distribution of young adult respondents by job status related to BMI (N = 111).

Total = 111

Table 2 shows, in respect of job status, that is executives and non-executives, out of 57 executives 15 were within normal cholesterol level. 31.5% of executives were in high cholesterol stage. Whereas, 22.22% non-executives had high cholesterol level. So, more executives had high cholesterol level compared to non-executives.

	Executives n (%)	Non executives n (%)
Normal (<200 mg/dl)	15 (26.3%)	27 (50%)
Borderline High (200-23 gmg/dl)	24 (42.1%	15 (27.77%)
High (≥ 240 mg/d1)	18 (31.57%)	12 (22.22%)
	Total = 57 (100%)	Total = 54 (100%)

Table 2: Distribution of the respondents (executives and non-executives) by cholesterol level.

Table 3 Shows that there is no underweight case among the executives. Among the female executives (66.66%) are conscious about keeping BMI within normal limit, whereas over weight is more in male executives (38.5%) comparing (16.66%) to their female colleagues.

	N	BMI			
Male	39	Under weight (<18.5) n (%)	normal (18-56-24.9) n (%)	over weight (25-29.9) (%)	Obese (≥30) n (%)
		0 (%)	24 (61.5%)	15 (38.5%)	0(0%)
Female	18	0 (0%)	12 (66.66%)	3 (16.66%)	3 (16.66%)

Table 3: Distribution of the young adult executives related to BMI according to sex.

Total = 57

Table 4 Shows over weight is quite similar (33.34%) among both male and female non-executive respondents whereas, 6.66% male non executives were under weight.

Table 5 Shows, nutritional status among all the respondents showed; 2.7% were under weight, 62.17% were normal, 32.43% were overweight and rest of all were obese.

Figure 1 Shows that the out of 111 respondents 93 were nor normotensive and 18 were hypertensive.

Figure 2 Shows that out of total respondents 16.3% were hypertensive and 83.7% were normotensive.

This figure 3 showed that the majority of respondent were (83.7%) were vaccinated and few (16.3%) were incomplete or no vaccination.

	N	BMI			
Male	45	Under weight (<18.5) n (%)	normal (18.5-24.9) n (%)	over weight (25-29.9) n (%)	Obese (≥30) n (%)
		3 (6.66%)	27 (60%)	15 (33.34%)	0(0%)
Female	09	0 (0%)	06 (66.66%)	3 (33.34%)	0 (0%)

Table 4: Distribution of the young adults non-executive related to BMI according to sex.

Total = 54

BMI	Weight status	Frequency	Percent
< 18.5	Under Weight	3	2.7
18.5 - 24.9	Normal	69	62.17
25 - 29.9	Over weight	36	32.43
≥ 30	Obese	03	2.7
		Total = 111	Total = 100%

Table 5: Distribution of respondents Body Mass Index.

Figure 1: Distribution of the respondents by Blood pressure.

Category	Systolic BP mmHg	Diastolic BP mmHg
Blood pressure:		
* Optimal	< 120	< 80
* Normal	< 130	< 85
* High normal	130 - 139	85 - 89
Hypertension:		
* Grade-1	140 - 159	90 - 99
* Grade-2	160 - 179	100 - 109
* Grade-3	≥ 180	≥ 110
Isolated Systolic Hypertension		
* Grade-1	140 - 159	< 90
* Grade-2	≥ 160	< 90

BP Chart

Figure 2: Distribution of the respondents by Blood pressure.

Figure 3: Distribution of the respondents by vaccination.

Figure 4 Shows that only 3% respondents liked fatty food, however 18% respondents liked carbohydrate rich food. About 36% respondents liked mixed food.

Figure 4: Distribution of the respondents by food habit.

Figure 5 showed that only 26.3% executives have cholesterol within normal level, 50% of non-executives had normal blood cholesterol level. More executives had high blood cholesterol level than non-executives.
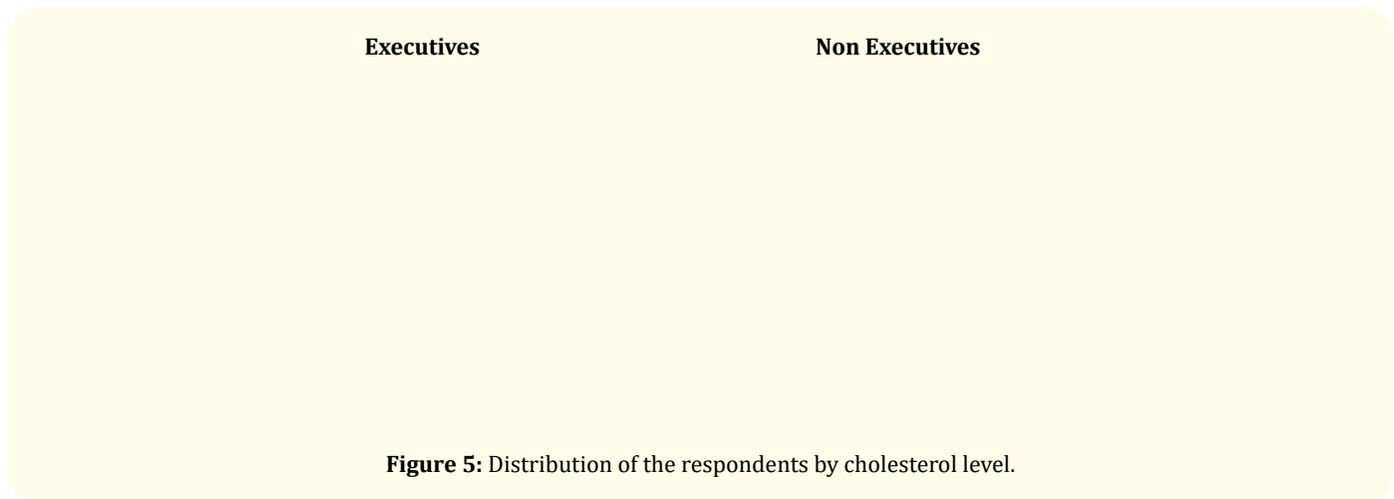
	Executives	Non Executives

Figure 5: Distribution of the respondents by cholesterol level.

Cholesterol Level

Normal: < 200 mg/dl
Borderline high: 200-239 mg/dl
High: ≥ 240 mg/dl

Table c

Figure 6 shows out 111 respondents 3 (2.7%) were underweight, 69 (62.1%) had normal BMI and 36 (32.43) were overweight
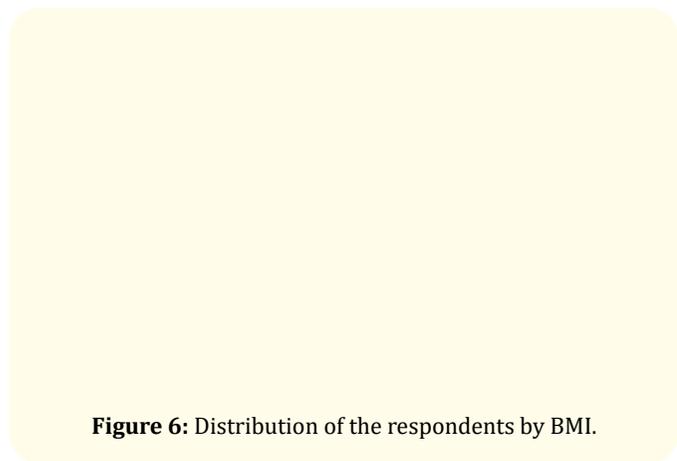

Figure 6: Distribution of the respondents by BMI.

Discussion

Bangladesh is a developing country. Government offices are run by its executives and non-executives. My subject was; "Nutrition and Cholesterol status of young adults in a selected are of Dhaka city".

Among all the executives 0% of them were under weight, 63.15% executives had normal BMI about 5.55% non-executives were under weight, 61.1% had normal BMI. (Table 1)

26.3% executives had normal blood cholesterol level where as 50% non-executives had normal blood cholesterol level. High blood cholesterol level found more among the executives which was 31.57% compared to non-executives (22.22%, Table 2).

Among the respondents according to sex there was no underweight case from the executives. About 66.66% female respondents had normal BMI comparing to their male colleagues, who were 61.5%. Overweight was found about 38.5% in male respondents, whereas 16.66% female were overweight (Table 3).

Overweight among the non-executives were similar (about 33.34%) both in male and female colleagues. About 6.66% male non executives were underweight. (Table 4)

Nutritional status among all the respondents 2.7% were underweight. 62.16% respondents were overweight (Table 5).

Regarding blood pressure, only 16.3% respondents had hypertension and 83.7% were normotensive (Figure 2).

Regarding vaccination; 83.7% respondents completed EPI vaccination but 16.3% were non or partially vaccinated (Figure 3).

Regarding food habit 36% respondents liked mixed food of all types. 33% respondents liked protein rich food. 21% respondents liked only vegetable (Figure 4).

About 26.3% executives had normal blood cholesterol level. 42.1% executives had borderline high cholesterol level and 31.5% executives had high blood cholesterol level.

But 50% non-executives had normal blood cholesterol level. 22.22% non-executives had high blood cholesterol level. So, high blood cholesterol level is common among the executives comparing to non-executives (Figure-5).

Regarding BMI, underweight and overweight were same (about 2.7%) among all the respondents. About 62.17% respondents had normal BMI (Figure 6).

Conclusion

1. Bangladesh is the eighth populous country in the world. Which is 1/3000 of the total area of the world. It is also one of the least developed country. In developing countries malnutrition in adolescence is a persistent major health problem. Alike other developing countries malnutrition in adolescence period is a problem for Bangladesh.

2. Everyone wants the inception of something new in his life style, which make his daily life easier and dynamic. Now a day's food safety issue and health consciousness are growing rapidly among the people.

3. The life style of the urban people is changing rapidly with influence of the west. They want something change in their regular dietary intake, which have added more fat in diet resulting obesity.

4. In my study, I found the respondents were well nourished and educated.

5. Their age, socio economic status, disease history, intake of food is very important for their nutritional and health status.

6. Majority showed their BMI to be normal.

Recommendation

1. Nutrition education programs need to be implemented to improve the nutritional status.

2. Appropriate food should be taken for under nourished and obese persons.

3. Regular physical exercise is needed for obese persons.

4. As I have not enough time to study, I did not do these studies so details. It should study elaborately in future.

5. All the recommendation can be carried out by the Government and NGO by arranging discussion, seminar, workshop, health care giver, community based clinic etc.

6. To aware the people by counseling, seminar, local NGO, print media and electronics media.

Bibliography

1. Acc/Scn, Forth on the world nutrition situation: Nutrition throughout the life cycle (2000).

2. Lee RD and Nieman DC. "Nutrition assessment". NewYork. MC Graw Hill, (2007).

3. Ferror-Luzzia., *et al*. "A simplified approach to assessing adult chronic energy deficiency". *European Journal of Clinical Nutrition* 46.3 (1992): 173-186.

4. Shetty PS., *et al*. "Body mass index: Its relationship to basal metabolic rate and energy requirements". *European Journal of Clinical Nutrition* (1994).

5. *Journal of Agriculture and Rural Development* 6.1-2 (2008).

6. BDHS, (2007).

7. WHO. (2010b).

8. Wellman and Kamp. (2008).

9. Steyn and Temple, (2008).

10. Blumerg, (1994).

11. Davidson's principles and practice of medicine, 20th edition

12. Dietary guidelines for Indians; National Institute of nutrition; Indian Council of Medical Research Hyderabad India.

13. Canadian food guide.

14. Swaminathan M. "Essentials of food and Nutrition". 2 (1985).

15. Nutrition and dietetics by shubhangini A Joshi, second edition, tata Mc Graw Hill, Published 299.

16. Anita FP Clinical Dietetics and nutrition, 2nd edition, New Delhi, Oxford university press (1986).

17. Good hart, RS and ME Shils, Modern nutrition in health and disease diet-therapy 5th edition. Philadalphia, Lea and Febiger 173.

18. Anderson JB. "The status of Adolescent Nutrition Today". (1991): 7-10.

19. Bull NL. "Our current dietary habits, Food consumption and Nutrition Intakes of Adolescents and young Adults'. *Nutrition Digest* 57 (1988): 24-74.

20. Fukaba H. "Our current dietary style and problems". *Toward the formation for diet in the Nineties* (1990): 15-74.

21. Fernando., *et al*. "Nutritive Related Health Consequences of urbanization". *Food Nutrition Bulletin* 69 (1998): 53.

22. Robinson. "Normal and therapeutic Nutrition".

23. C Gopalan. "Nutritive value of Indian foods".

24. WHO, Global strategies for non-communicable disease prevention and control. WHO/NCD/GS/97, Geneva, (1997).

25. David T. "LINDSAY Functional human anatomy USA".

26. Mckeigue PM. "Coronary heart disease in Indian, Pakistanis and Bangladeshi Etiology and Possibilities for Prevention". *Indian Heart Journal* 67 (1992): 341-342.

27. Perspectives in Nutritive, Gordon. M. Wardlaw, Paul M. Insd, 3rd edition 657.

28. Nutrition (2nd edition) Principles and Application in health promotion by Carol Jean West Suitor Merrily Forbes Crowley.

29. Applied Nutrition and diseases by Arte Bhatia.

30. The theoretical basis for the life model research and resource on human development (www.lifemodel.org)

31. Levinson, ÒConception 293.

32. Sheehy. 14.

Volume 3 Issue 1 January 2018