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Nutrition and Pattern of Food Consumption for Undergraduates Students of Shendi University

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Abstract:

This cross sectional study was designed to identify the nutritional status of Shendi University students in as a comparison between campus students and those were living with their families or in outside accommodation. The study was applied randomly on the last year students of Science and Technology College, aged 18 and 25 and unmarried. Clinical investigation (hemoglobin and total protein) and anthropometric measurements (body mass index) were used to achieve the study objective. The study revealed that 52% of samples were living in campus and 48% were living outside of campus. The study revealed that the student's clinical parameters were influenced by accommodation type, gender, family size, monthly expenditure, daily meals, stimulants intake, and athletic activity. The presence of campus students for long period, especially those who came from distant states where they were staying about four months in the campus, unlike those who came from nearby areas (River Nile State) whom weekly were frequented their families at least. The average income of family so as the monthly expenditure of student has a clear effect on the nutritional status of the students, thus improving the monthly student expense turn reflected in the improvement of food because the high price food is often high nutritional benefits.

Key words: Shendi, River Nile State, Hemoglobin, Total protein and Body mass index.

INTRODUCTION:

Evaluation of the nutritional status of individuals and population groups is a tool of vital importance in public health and feasible indicator of standard of living [1]. Nutrition is complex: a broader profile of nutrients should be considered rather than focusing solely on a single nutrient. Evaluating food patterns instead of intake of individual nutrients provides better insight into relationships between nutrition and health and disease [2]. Food intake surveys are widely used to assess nutritional status and are available for many countries. In many cases they indicate that people do not manage to achieve a balanced diet and intake of essential nutrients according recommendations [3].

Throughout a lifespan, inadequate nutrition is related to several chronic diseases that greatly impact morbidity, mortality, and quality of life. Adequate nutrition is essential to a healthy life and healthy aging on an individual as well as on a societal level [4]. The public health implications of balancing nutrient intakes and thus reducing malnutrition and the prevalence of non-communicable disease are enormous, consequently cutting down healthcare spending around the world [5]

Admission to higher education is considered an outstanding moment in the psychosocial development of young students, because new behavior patterns are adopted in this period, as well as social and affective experiences [6]. Research has revealed that college students show low prevalence of healthy eating, with a high intake of fat and added sugar and a low intake of fruits and vegetables [7]. The transition occurs simultaneously with a number of other changes in the student's life. For many youngsters, the university is the first time that they will have to be responsible for managing their housing, feeding and finances [8]. The greatest determinants of food choice were taste, value, convenience, and cost. Female

students placed more importance on health-related factors and followed more special dietary behaviors than male students [9].

Over the last century, nutritionists have worked intensively on the question how to assess, and address, the nutritional needs of individuals and groups. Many reports have been published on the Recommended Daily Allowances (RDA) of macro- and micronutrients [10,11]. Most university students did not meet the recommended intakes for most the micronutrient and micronutrient [12]. Adequate nutrition for example balanced for growth, energy, and maintenance [13]. The selection of unhealthy food, high cost of healthy food and ease of availability of fat food may have a negative impact on university students eating behaviors [14]. University students may face difficultly in regulating eating behavior since it is the transition of where they staying away from family home. Students living away from family home tend to develop poor eating habits compared to students who live at the family home [15]. Notwithstanding, few studies have investigated the nutritional profile of university students and factors associated with such profile. Such data could be useful in guiding the planning and implementation of health interventions at the university or an institution considered to be important in forming students' habits [16].

2. STUDY OBJECTIVE:

2.1. *General objective*

This study aimed to assess the nutritional status of science and technology college students, Shendi University.

2.2. *Specific objectives:*

To determine the level of:

- Heamoglobin concentration.
- Serum total protein.
- Body mass index.

3. SAMPLE:

3.1. *Study community:*

This study was done in the faculty of science and technology, Shendi University.

3.2. *Study Nature:*

Cross-sectional community based study.

3.3. *Inclusion criteria:*

- Both sexes.
- Age group 18 -25.
- Exclusion married students
- Agreement of student.

4. MATERIALS AND METHODS:

4.1. Materials:

4.1.1. *Chemicals and reagents:*

- EDTA
- Kits of haemoglobin estimation.
- Kits of protein estimation.

4.1.2. *Instruments:*

- Measuring tape was used for measuring the length of the student.
- Scale was used for weighing the students.
- Centrifuge was used for separation serum.
- Spectrophotometer was used for estimation of hemoglobin and serum total protein.

4.2. Study methods:

4.2.1. ***Questionnaire:*** including information about social, economic, educational and dietary state of students and their families.

4.2.2. ***Anthropometric measurements:*** weight, height and then body mass index (BMI) was calculated according to following WHO criteria:

BMI was calculated using following formula:

$$\text{BMI (Kg/m}^2) = \frac{\text{Weight (Kg)}}{\text{Height (m}^2)}$$

- Underweight <18.5 kg/m^2
- Normal weight 18.5-24.9 kg/m^2
- Overweight 25-29.9 kg/m^2
- Obesity (>30 kg/m^2)

4.2.3. ***Laboratory investigation:*** 4ml of blood sample was collected from each student and then was divided foe examination of:

- Whole blood: the blood was collected in EDTA container for estimation of haemoglobin.
- Serum: after separation from RBCs, the serum was kept in refrigerator at -4C^0 until analyzed for serum protein.

4.2.3.1. ***Heamoglobin estimation:***

Heamoglobin was estimated by cyanomethaaemoglobin method in which it was treated with a reagent containing potassium ferriccyanide, potassium cyanide and potassium dihdrogen phosphate. The ferric cyanide forms methaemoglobin, which converted to cyanomethaemoglobin by the cyanide and measured by spectrophotometer (Gowenlock, 1988).

4.2.3.4. ***Serum protein estimation:***

Serum protein was estimated by Biuret method in which protein reacts with cooper ion in alkaline medium forming a coloured complex that can be measured by spectrophotometer.

5. RESULT:

The hemoglobin and total protein concentration were investigated, also weight and height were determined and then the body mass index was calculated of each student in the sample. The data was collected and illustrated in the following tables:

Table 1: Distribution of sample according to gender

Gender	Percentage
Male	42.50
Female	57.50

Table 2: Hemoglobin and total protein concentration according to accommodation type

Type of accommodation		Hemoglobin	Total protein
Male	Campus	12.85	6.33
	Outside	14.44	7.44
Female	Campus	12.36	5.87
	Outside	12.39	6.40

Table 3: Hemoglobin and total protein concentration according to gender

Gender	Haemoglobin	Total protein
Male	13.78	6.90
Female	12.38	6.52

Table 4: Concentration of parameters according to daily meals

Type of accommodation	Three meals		Two meals	
	Hemoglobin	Total protein	Hemoglobin	Total protein
Campus	13.65	7.10	13.22	7.00
Outside	13.40	7.44	13.30	6.55

Table 5: clinical parameters concentration according to family size

Family size	Hemoglobin	Total protein
Less than 5	14.6	7.3
6- 10	13.9	6.7
More than 10	12.8	6.3

Table 6: Clinical parameters according to athletic activity

Activity	Hemoglobin	Total protein
Non athlete	**13.9**	**6.3**
Athlete	**13.7**	**6.5**

Table 7: Clinical parameters according to stimulants

Stimulant	Hemoglobin	Total protein
Tea	**12.1**	**6.3**
Coffee	**12.4**	**6.4**
Cigarettes	**12.3**	**6.2**

Table 8: Body mass index percentage of study samples

The index	Percentage
Under weight	0.75
Normal	96.25
Over weight	2.25
Obesity	0.75

Table 9: Body mass index percentage according to gender

Mass index	Male (%)	Female (%)
Under weight	1.0	0.48
Normal	97.4	95.67
Over weight	1.6	2.41
Obesity	-	1.44

Table 10: Body mass index percentage according to accommodation type

Mass index	Campus (%)	Outside (%)
Under weight	0.78	-
Normal	98.96	91.66
Over weight	0.26	5,83
Obesity	-	2.50

6. DISCUSSION:

The study also showed that accommodation type has a clear effect on the nutritional status of the students of the faculty of science and technology. The average concentration of hemoglobin concentration was higher among those who live with their families compared to those living in campus (Table 2) this may be due to consumption of variety foods types such as vegetables and fruits, which represent rich source of hemoglobin components but the students who live in campus the study found that the hemoglobin concentration was less because their intake food was not available as needed. While at the same time the study was found that the average of protein concentration is higher among campus students when it compared with those were living with their families and this could be explained due to the fact that the food intake in the residential complexes depends mostly on the protein materials as beans.

In table 3, the study showed that the concentration of hemoglobin was decreased in females compared with males (p 0.005). This could by attributed scientifically to monthly loss through menstrual cycle and uninterested of female in good eating which have important nutrients for the hemoglobin manufacture and this may be due to return to housing in extreme fatigue state in addition the weak female structures and excessive overdose of exams.

The study in table 4 was revealed that meals number had impact on the nutritional status of university students, where it was found that the average concentration of hemoglobin and protein were increased with taking meals where it supports them.

Table 5 shows that the family size has a clear influence on the nutritional status of the students. Otherwise the type of food intake has a clear effect on the nutritional status of students of the faculty of science and technology, where the

concentration of hemoglobin was found to be higher in those who ate mixed food and less in those who depend on their food on a few limited varieties because good health depends on the variety composition of food that includes all the nutrients of carbohydrates, fats, proteins, vitamins and minerals.

There was reverse relationship - in table 5 - between student family size and hemoglobin concentration that may be attributed to that larger family size often accompanied with less available food intake result in lees absence of necessary elements of situation improvement, as opposed to the smaller family size, the better the distribution of healthy food. Whilst protein concentration was found to be not affected by the family size, this can be attributed to that the student was obtaining of proteins quantity from legumes away from his family during the teaching day or into residential complexes.

In Table 6, the study showed that the stimulants had a clear effect on the nutritional status of university students. It was found that the hemoglobin concentration varies according to the type of stimuli and the least group on those were continuously drinking tea which could attributed to reduced effect of tea on the iron mineral absorption especially direct after meals. Table 7 showed that the athletic activity had an impact on the nutritional status. The hemoglobin concentration in non athlete was higher than the athletic student. In contrast, the mean protein concentration was higher in the athletic students this can be attributed to the effectiveness of the metabolism process in the sports student. The study in tables 8, 9and 10 showed that the most of sample study was in the normal state and also reflected that the body mass index was somewhat agreeable with clinical parameters, where it better on female than male and more less in campus student when it compare with outside accommodation students.

7. CONCLUSION:

The economic factors play an important role in determining of the quantity of food intake as and quality among the students of the study sample and consequently affect the nutritional status of sample students. It is necessary to work on providing integrated health food for campus students in a special way, as well as to care for the healthy environment in their areas of residence.

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