

NURITIONAL STATUS OF COLLEGE GIRLS OF FAISALABAD CITY.

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A nutrition assessment study was undertaken on 805 girls of 17-22 years age from the two local girls colleges of Faisalabad city. Different nutritional status indicators i.e. anthropometric, biochemical and dietary, were used to evaluate the degree of malnutrition. The study revealed that the height, weight, skinfolds thickness, arm circumference values were significantly below the international standards. Haemoglobin content in 20% of the total randomly selected cases, total serum proteins and serum albumin in 45 randomly selected cases were found to be below the international standards in all age groups. Nutrient contents in diet were found to be below the recommended allowances. Our results show that inadequate supply of food to the college girls and socio-economic system were mainly responsible for poor anthropometric indices and of high prevalence of anaemia among those apparently health young girls.

INTRODUCTION

Nutritional status of a community is the determinant of health status. Though the body make-up is genetically determined, but besides hereditary factor, nutrition plays an important role in the growth and maintenance of the body(1).

Malnutrition is one of the major health problems in Pakistan, as it lowers resistance to infectious diseases. Under-nutrition results in poor anthropometric indices, health, fitness and physical activity. These aspects are very much related to normal functioning of life and ensure reduced morbidity(2).

The measurement of selected anthropometric, biochemical and immunological variables, and clinical judgements can be used to assess nutritional state. Nutritional assessment has three main aims, to define the type and severity of malnutrition, to identify high-risk patients and to monitor the efficacy of nutritional support(3).

The present study is designed to ascertain nutritional status of selected population i.e. college girls of age of 17-22 years from Faisalabad city. Such informations are necessary to establish national standards, for estimating dietary requirements and also provides a base-line for future nutrition programmes to improve the health of the people. We have used different indicators of nutritional status to identify the overall prevalence of malnutrition in selected population.

MATERIALS AND METHODS

805 girls were randomly selected from the two local girls colleges from Faisalabad city for anthropometric measurements, biochemical tests and dietary evaluations. 20% of the total sample were randomly selected for haemoglobin determination. Total serum proteins and albumin were estimated in 45 randomly selected cases. Dietary evaluations were conducted to

calculate daily nutrients intake. A 24 hours weighing method for three alternate days was adopted. Age was recorded from the college registers.

(A) ANTHROPOMETRIC MEASUREMENTS

- (1) WEIGHT: Bath room scale/Foot balance was used to record the weight of the students bare-footed and wearing light garments and the readings were recorded in kilograms.
- (2) HEIGHT: Wooden vertical rod graduated in centimeters was used. Readings were taken bare-footed in fully erected position.
- (3) ARM CIRCUMFERENCE. Fiber glass tape rod was used. The readings were taken in centimeters when the arm was in loose position.
- (4) SKINFOLDS THICKNESS(TRICEPS): Large skinfold calliper was used for these measurements. The skin parallel to the long axis was picked up between the tips of the acromion process of the scapula and olecranon process of ulna of the left arm and thickness was measured in millimeters.

(B) BIOCHEMICAL ANALYSIS.

- (1) HAEMOGLOBIN ESTIMATION. Spencer hemoglobinometer was used for haemoglobin estimation in the blood; results are indicated as gram of haemoglobin per 100 ml of blood.
- (2) SERUM PROTEINS AND ALBUMIN: Total serum proteins and albumin were estimated using the method of Oser 1969. Results are shown as gms/100 ml of blood.

(C) DIETARY ANALYSIS.

Informations on dietary evaluation were gathered by weighing foods consumed by the students during 24 hours period for 3 alternate days. The data on food intake were then converted into nutrients using food tables of Anonymous 1970(4).

RESULTS

Anthropometric measurements are shown in table 1 for height, weight, skinfolds thickness, and arm circumference of college girls of the age ranging between 17-22 years.

The mean values for height are 153.2, 155.06, 156.1, 155.7, 156.1 and 157.8 centimeters respectively. Our findings show that the average height of the girls is significantly low when compared with corresponding standard values.

The mean values for weight are 41.3, 43.0, 44.3, 43.7, 45.6 and 48.2 kg respectively. The values were found to be significantly low when results were compared with international standards. The girls of 17 years age were under - weight to the maximum extent among all age groups studied.

The mean values for skinfolds thickness were 13.7, 14.6, 14.7, 15.4, 16.3, and 15.5 mm respectively. Results of age groups of 17, 18, 19, and 20 year were significantly below the international standards. While values of age groups of 21 and 22 years were comparable to standard values.

The mean values for arm circumference were 20.4, 20.6, 21.3, 21.2, 21.6 and 22.2 cms

TABLE - I : Anthropometric Measurements of College Girls (17-22 Years)

AGE YEARS	NO. EXMED	MEAN HT OBSERVED (cms)	STANDARD HEIGHT	%AGE OF THE STANDARD	MEAN WT OBSERVED KG	STANDARD WEIGHT KG
17	113	153.2	162.5	94.3	41.0	54
18	337	155.1	162.5	95.8	43.0	54.4
19	152	156.1	-	-	44.3	54.6
20	128	155.7	-	-	43.7	55
21	64	156.1	-	-	45.6	55
22	11	157.8	-	-	48.2	55

%AGE OF THE STANDARD	MEAN SFT OBSERVED (mm)	STANDARD SFT (mm)	%AGE OF THE STANDARD	MEAN ACF OBSERVED (cms)	STANDARD ACF (cms)	%AGE OF THE STANDARD
76.4	13.74	16.5	83.2	20.44	24.9	82.08
79	14.63	16.5	88.6	20.65	28.5	72.45
81.1	14.71	16.5	89.1	21.39	28.5	75.05
79.5	15.48	16.5	93.8	21.21	28.5	74.42
82.2	16.2	16.5	98.2	21.21	28.5	75.85
87.7	15.77	16.5	95.6	22.25	28.5	78.07

TABLE - II: Average Haemoglobin values of College Girls (17-22 years)

AGE YEARS	NUMBER EXAMINED	MEAN HB (gms/100ml)	S.E.	STANDARD HB (gms/100 ml)	%AGE OF STANDARD	LEVEL OF SIGNIFICANCE
17	22	11.45 (10.72-12.18)	0.73	12	95.42	N.S
18	67	10.98 (10.51-11.45)	0.47	12	91.5	**
19	30	11.38 (10.65-12.11)	0.73	12	94.83	N.S
20	26	10.78 (9.79-11.77)	0.99	12	89.83	**
21	13	11.46 (10.48-12.44)	0.98	12	95.5	N.S
22	2	12.75 (12.31-13.29)	0.54	12	106.25	N.S

respectively. Similarly these values are significantly below the international standards and the difference is maximum for age group of 18 years.

TABLE - III: Serum Albumin and Serum Proteins values of College Girls (17-22 years)

NO. OF GIRLS EXAMINED	ALBUMIN		PERCENTAGE OF THE STANDARD	AVERAGE PROTEIN gm/100ml	STANDARD PROTEIN gm/100ml	PERCENTAGE OF THE STANDARD
	AVERAGE ALBUMIN gm/100ml	STANDARD ALBUMIN gm/100ml				
45	2.70	4.30	62.79	4.84	6.80	71.18

TABLE - IV: Nutrient intake per girl per day

NUTRIENTS	NUTRIENTS INTAKE	RECOMMENDED INTAKE	PERCENTAGE OF THE RECOMMENDED LEVEL
Calories	1525.0	1800.1	84.7
Protein(gm)	39.1	42.0	93.1
Fat (gm)	59.6	-	-
Iron (mg)	9.5	28.0	34.0
Vitamin A (I.U)	1118.8	2984.0	37.5
Thamin(mg)	1.2	0.9	132.2
Riboflavin (mg)	0.5	1.2	43.3
Vitamin C (mg)	34.6	30.0	115.3

Biochemical investigations results are indicated in table II, which shows results of haemoglobin concentration 160 randomly selected girls of age between 17-22 years. The Hb concentrations were 11.45, 10.98, 11.38, 11.46 and 12.75 gms/100 ml respectively. Age group of 18 and 20 years show significant difference when compared with international standards, while other age group values level with international standards.

In 45 randomly selected girls average total serum proteins contents were 4.84 gm/100 ml and serum albumin levels were 2.70 gm/100 ml. Both values differed significantly from international standards indicating dietary protein deficiency (table III).

Dietary findings are indicated in table IV. Meal pattern of three meals per day (morning meal, mid-day meal and evening meal) was prevalent. The morning meal consisted of cereal flour made as roti or paratha, usually taken with tea. Mid-day meal consisted of roti with vegetables and/or in combination with meat; twice a week rice was given. Evening meal did not differ much from mid-day meal and consisted of roti with vegetable or pulses.

The nutrients consumption was significantly below the recommended daily allowance. Per capita intake of calories was 1525 which were 15.3% less than the recommended.

DISCUSSION

In present study we found, average anthropometric values for height, weight, mid-arm circumference and skin-fold thickness of Pakistani girls from Faisalabad city of 17 to 22 year of age groups, significantly low, when compared to their counterparts in well-fed countries and

international standards (5). The same situation is found in all other biochemical and dietary parameters studied i.e. haemoglobin, total serum proteins, serum albumin and daily dietary intake.

A number of factors may be possibly responsible for low values of anthropometric parameters when compared to international standards. Though the genetic make-up differs from individual to individual, even then the genetic pool of a particular population remains in equilibrium, so the average anthropometric values are almost constant and representative of a specific population while other factors are variable but are valuable and sure determinants of existing nutritional status i.e. malnutrition and under-nutrition, food habits, cooking practice environmental and socio-economic factors. In this study results of dietary intake and biochemical evaluations (Table II, III) are in conformity with anthropometric findings (Table I), and support the conclusion that inadequate intake of nutrients both macro nutrients and micro nutrients resulted in low values for height, weight, mid-arm circumference and skin-fold thickness. Similarly, low values of biochemical tests were found in all age groups. [The studied parameters were haemoglobin, total proteins and serum albumin which are markers of nutritional status (6)] It was probably due to inadequate dietary intake which results in poor availability of precursors, for body constituents. Our data relating nutritional status of college girls identifies the overall prevalence of malnutrition and provides interesting informations, as the study was done on random subjects of different age groups with different socio-economic back grounds all with poor anthropometric indices and high prevalence of anaemia among those apparently healthy young girls.

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