



## **Ministry of Health & Population**

### **Sector of Integrated Services & Nursing**

#### **Integrated Nutritional Health Program**

**Minia Governorate**

**In Collaboration with**

**TAHSEEN-Pathfinder International**

**&**

**Health Care International, *HCI***

### **Overall Analysis & Recommendations**

#### **Report**

**December 2005**

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## Overall Analysis Report

### Section I

#### Student Sample Distribution and Medical Findings (History and Examination)

Medical history and examination were carried out for 826 students. Their distribution is shown in Table (1).

Males and females were almost equal in number, about one quarter of the sample were from Mallawi district, and a similar percentage from Minia district, whereas Samalout district got half of the governorate sample, since Samalout represents the northern region of Minia governorate including 5 districts (Maghagha, Edwa, Beni Mazar, Matay and Samalout) out of the 9 districts of Minia governorate.

Minia district represents the middle region of Minia with 2 districts (Minia and Abu Qurqas) and Mallawi represents the southern region with 2 districts (Mallawi and Deir Mawas).

The most important medical history findings (Table 2) were: passing worms (28.5% of the sample) and bilharziasis (9.1%). Urine analysis revealed that 6.9% of the sample had bilharziasis. History reflects both current and past infection with bilharziasis. Previous infection, even cured, may have its negative impact on the malnutritional status of children, especially for indicators such as stunting reflecting chronic cumulative adverse effects.

The most important medical examination findings (Table 3) were that about one third of examined students (32.3%) had pytriasis alba, reflecting possible micronutrient deficiency (Vitamin A or iron). Other manifestations of malnutrition were also quite common: mucous membrane pallor (37.6%) reflecting anemia, cheilitis (30.5%) associated with vitamin deficiency, especially vitamin B and transverse lines on nails (39.01%) reflecting iron-deficiency anemia.

Thyroid enlargement, associated with iodine deficiency, had a prevalence of 17.1% (of which 1% could be both seen and palpated, possibly denoting genuine simple goiter). Minia is more than 450 kilometers south from the Mediterranean sea and marine fish consumption in rural Minia is quite low as revealed by community interviews, so iodine deficiency is quite expected, unless iodized salt is used.

More than 70% had at least one decayed tooth (72.6%). Pediculosis was not of negligible frequency (reaching 26.8% among preparatory school girls who are presumably better off than girls not attending school). More than one quarter of the sample (27.7%) had a reduced visual acuity of 6/18 or less.

In short, medical history and examination findings gave clinical evidence for possibly significant malnutrition problems in this population.

**Table (1)**  
**Distribution of the Study Sample of Students by Scholastic Year, Sex and District**  
**and Mean ages (years) of Different Groups**

District	Primary (4 <sup>th</sup> year)		Preparatory (1 <sup>st</sup> year)		Total			
	Male	Female	Male	Female	Male	Female	Total	
	No.	No.	No.	No.	No.	No.	No.	%
Minia (age: Mean +/- SD)	<b>45</b> 9.8 +/- 0.6	<b>60</b> 9.8 +/- 0.5	<b>46</b> 12.7 +/- 0.4	<b>50</b> 13.0 +/- 0.8	<b>91</b>	<b>110</b>	<b>201</b>	<b>24.3</b>
Mallawi (age: Mean +/- SD)	<b>77</b> 9.8 +/- 0.5	<b>26</b> 9.9 +/- 0.4	<b>30</b> 13.2 +/- 0.7	<b>75</b> 13.3 +/- 0.9	<b>107</b>	<b>101</b>	<b>208</b>	<b>25.2</b>
Samalout (age: Mean +/- SD)	<b>108</b> 9.8 +/- 0.5	<b>96</b> 9.8 +/- 0.4	<b>106</b> 12.7 +/- 0.7	<b>107</b> 12.8 +/- 0.8	<b>214</b>	<b>203</b>	<b>417</b>	<b>50.5</b>
<b>TOTAL</b> (age: Mean +/- SD)	<b>230</b> 9.8 +/- 0.5	<b>182</b> 9.8 +/- 0.5	<b>182</b> 12.8 +/- 0.6	<b>232</b> 13.0 +/- 0.8	<b>412</b>	<b>414</b>	<b>826</b>	<b>100</b>

**Table (2)**  
**Medical History Findings**

History Findings (% positive)	Primary (4 <sup>th</sup> year)		Preparatory (1 <sup>st</sup> year)		Total (N= 826 )
	Male (N=230 )	Female (N= 182 )	Male (N= 182 )	Female (N= 232 )	
Passing worms	24.8	33.5	25.3	30.2	28.5
Recurrent abdominal pain	51.7	57.7	46.7	55.2	52.9
Anal itching	23.0	24.9	18.1	22.0	22.1
Diabetes mellitus	-	-	-	-	-
Tuberculosis	-	-	0.5	-	0.1
Rheumatic fever	0.4	-	0.5	1.3	0.6
Chronic Recurrent Cough	11.7	18.9	20.9	14.7	16.2
Repeated Tonsillitis	20.0	30.8	29.7	25.5	26.1
Bilharziasis	9.1	3.3	13.7	8.3	8.6

Table (3)

## Medical Examination Findings

Examination Findings (% positive)	Primary (4 <sup>th</sup> year)		Preparatory (1 <sup>st</sup> year)		Total (N= 826 )
	Male (N= 230)	Female (N= 182 )	Male (N=182 )	Female (N=232 )	
<b>Face:</b>					
Pytriasis alba	41.0	28.2	41.8	19.5	32.3
<b>Eyes:</b>					
Xerosis	0.9	-	0.5	0.4	0.5
Bitot spots	1.3	1.6	2.2	1.3	1.6
Visual acuity (6/18 or less)	22.6	25.8	36.3	26.7	27.7
Conjunctival pigmentation	8.9	7.6	13.1	11.5	10.2
<b>Lips:</b>					
Cheilitis	21.3	22.7	43.6	35.5	30.5
Angular stomatitis	11.4	9.9	16.1	11.3	12.1
Mucous membrane pallor	41.7	29.3	42.5	36.2	37.6
<b>Tongue:</b>					
Oedema	0.9	0.6	-	-	0.4
Fissured	7.8	4.4	19.9	15.9	12.0
Glossitis	2.6	1.6	-	0.9	1.3
Atrophic papillae	11.7	17.1	12.2	22.0	15.9
<b>Skin:</b>					
Xerosis	12.2	7.1	5.0	3.0	6.9
Follicular hyperkeratosis	3.1	3.8	12.7	8.7	6.9
<b>Nails:</b>					
Flat	10.5	18.1	8.8	6.9	10.8
Spooned	8.8	14.3	9.3	3.9	8.8
Clubbing	2.2	6.6	9.3	3.5	5.1
Transverse lines	35.4	43.1	41.4	37.5	39.0
<b>Hair:</b>					
Not healthy	12.2	13.2	13.3	22.8	15.8
Pediculosis	5.4	15.8	6.2	26.8	13.4
<b>Goitre:</b> G1 (seen)	12.7	16.6	14.9	23.8	17.1
G2 (seen & felt)	-	-	1.1	2.6	1.0
Cardiovascular abnormality	3.0	2.7	3.8	1.7	2.7
Respiratory abnormality	4.7	6.6	4.3	3.0	4.0
GIT abnormality	-	-	-	-	-
Decayed teeth	80.0	70.9	73.6	65.9	72.6

## Section II

### **Anthropometry, Urine Analysis, Stool Examination Findings and Hemoglobin Level of Examined Students**

Anthropometric measurements were carried out using standard methodology. The sample size was adequate to reach accurate estimates for each subgroup. The standard error of the mean (standard deviation / Square root of the sample size) was quite low, much lower than 5% of the value of the mean itself, which is considered the cut off point for acceptable relative standard errors.

Anthropometric data are presented in tables (4 - 6).

Heights and weights for all groups were lower than national averages, as reported by the National Survey of Egyptian Adolescents (10-19 years) (ASCE) carried out in 1997 and obviously lower than the international reference values. This is quite expected for rural Minia. However, for body mass indices, Minia values were not much different from national and international values, since both weights and heights were concurrently reduced (although not to the same extent).

Obesity prevalence (estimated as Body Mass Index exceeding international reference 97<sup>th</sup> percentile) is quite low. The prevalences of stunting (height below international reference value of 3<sup>rd</sup> percentile) and underweights (weight below international reference value of 3<sup>rd</sup> percentile) varied between 24.4 % and 33.2 % for stunting and varied between 14.0 % and 22.7 % for underweights, i.e, stunting was much more prevalent than underweight. This is quite unfortunate, since stunting (reduced body stature) reflects chronic cumulative malnutrition.

The human development index (HDI) for Minia was 0.609 for Minia Governorate compared to the national figure of 0.680. The Minia HDI was among the lowest among Egyptian governorates (only Fayoum was lower than Minia). It is quite expected that even, within Minia, rural areas would have lower HDIs, although we do not have data on this issue.

The picture is even more gloomy for anemia profile among rural Minia students. The prevalence of anemia among primary school students (using the cut off point of 12 gm/dl) was 63.8% for males and 80.9 % for females which is much higher than the national figures. Whereas the prevalence of anemia among preparatory students was 48.3 % among males and 45.6 % among females, which are extremely high, but still slightly lower than national figures.

Perhaps this could reflect a selection bias (poor children, presumably more at risk of anemia, may not continue to the preparatory school).

The high prevalence of anemia, compared with the prevalence of stunting and underweight, reflects a qualitative defect in nutrition, bearing mainly on iron, other micronutrients and proteins. This corroborates with subsequent findings on dietary intake to be presented in sections below. A highly significant correlation was found between hemoglobin level and weight ( $P < 0.01$ ) and height ( $P < 0.01$ ) i.e., anemic children are more at risk of stunting and being underweight.

The prevalence of urinary bilharzias is much lower than it used to be, but still it is not negligible (more than 10% among primary school boys). Bilharzia prevalences follow the expected pattern, being higher among boys than girls and among smaller children than older ones, because of variability in exposure to canal water, where the infectious cercaria exist.

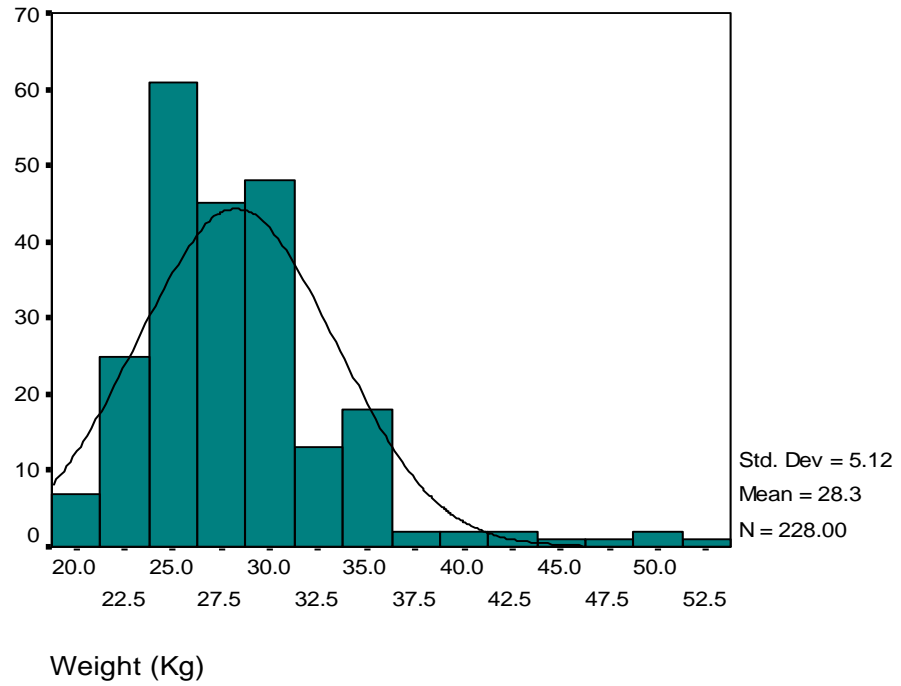
Except for Oxyuris ova and Entameba Cysts (with prevalences of 20.2% and 12.3% respectively), only Ascaris ova and Hymenolepis nana ova were found in few cases in stool (prevalences: 1.5 % and 0.9% respectively). The widespread infection with Oxyuris and Entameba reflects a lack of personal hygiene and sanitary facilities.

**Table (4)**  
**Weights of Different Groups Compared with**  
**International and National Standards**

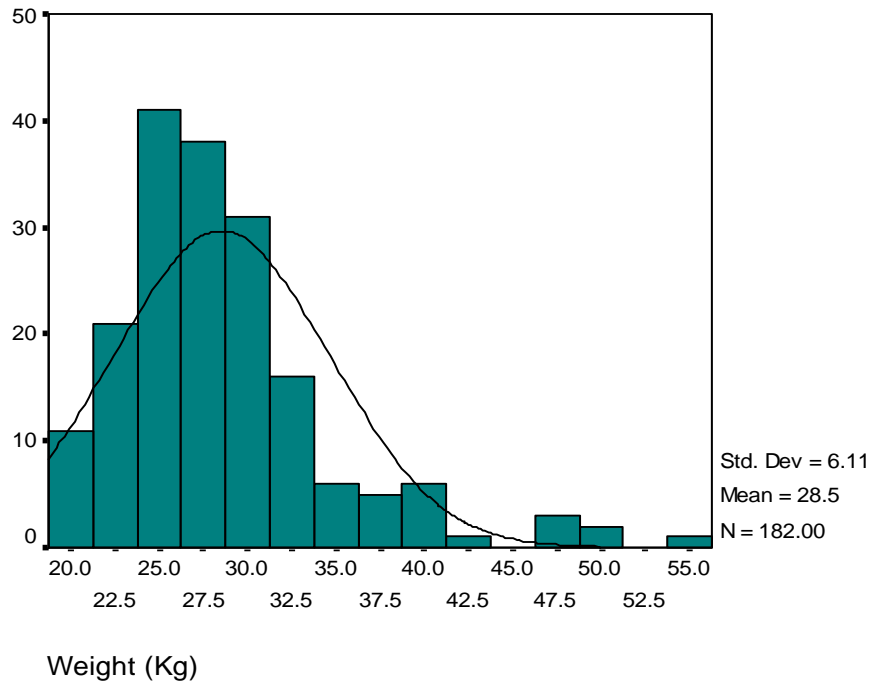
Primary (4 <sup>th</sup> year)	Mean height (Kg.) +/-SD	Median (Kg.)	International corresponding value (NCHS)	National corresponding value (ASCE)	Minia/ International %	Minia/ National %	Estimated Percentage under international P3
Male (n= 278)	28.25 +/- 5.12	28.00	31.18	31.9	89.8	88.6	14.0
Female (n=182)	28.54 +/- 6.11	28.00	32.03	30.5	87.4	91.8	17.0
<b>Preparatory (1st year)</b>							
Male (n= 181)	36.92 +/-7.66	35.00	44.05	42.2	79.54	87.4	22.7
Female (n= 229)	40.79 +/- 8.44	40.00	45.65	49.1	87.61	83.1	21.4

## Weights of Students

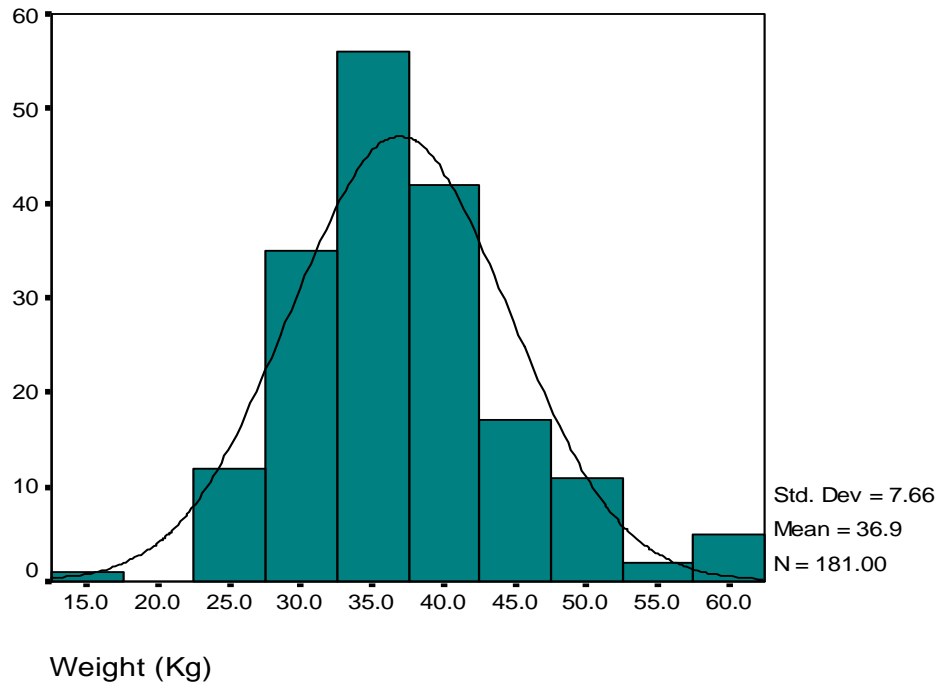
### 1- Fourth Primary Male



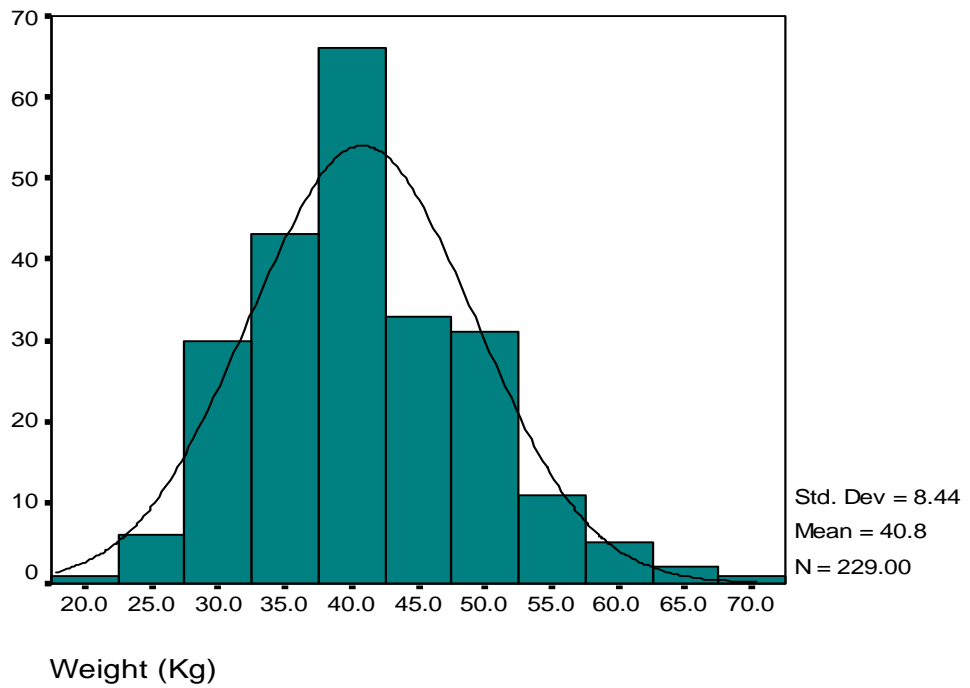
### 2- Fourth Primary Female



### 3- First Preparatory Male



### 4- First Preparatory Female

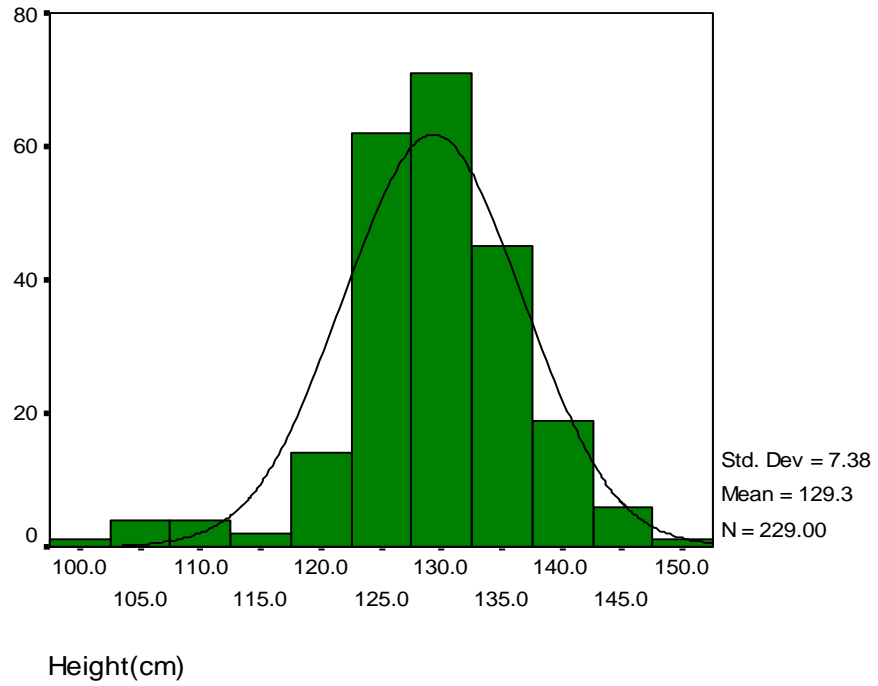


**Table (5)**  
**Heights of Different Groups Compared with International and National Standards**

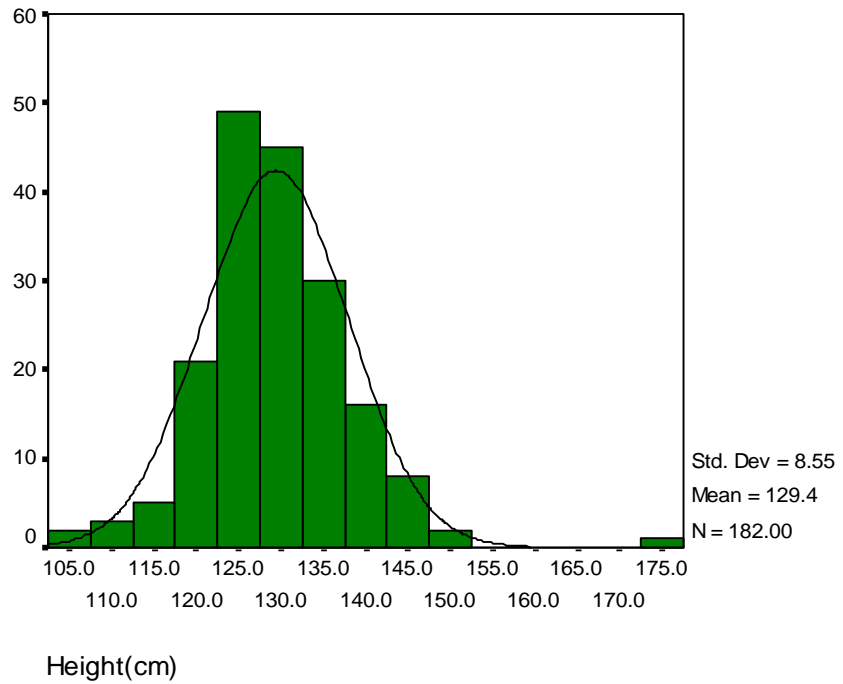
Primary (4 <sup>th</sup> year)	Mean height (cm.) +/-SD	Median (cm.)	International corresponding value (NCHS)	National corresponding value (ASCE)	Minia/international %	Minia/National %	Estimated Percentage under international P3
Male (n= 229)	129.32 +/- 7.38	130.0	137.59	136.4	94.4	95.3	25.3
Female (n=182)	129.39 +/- 8.55	129.0	136.90	134.5	94.2	95.9	24.7
<b>Preparatory (1st year)</b>							
Male (n= 180)	143.42 +/- 7.33	142.5	153.87	150.9	92.6	94.4	24.4
Female (n= 229)	145.99 +/- 7.60	146	156.96	152.2	93.0	95.9	33.2

## Heights of Students

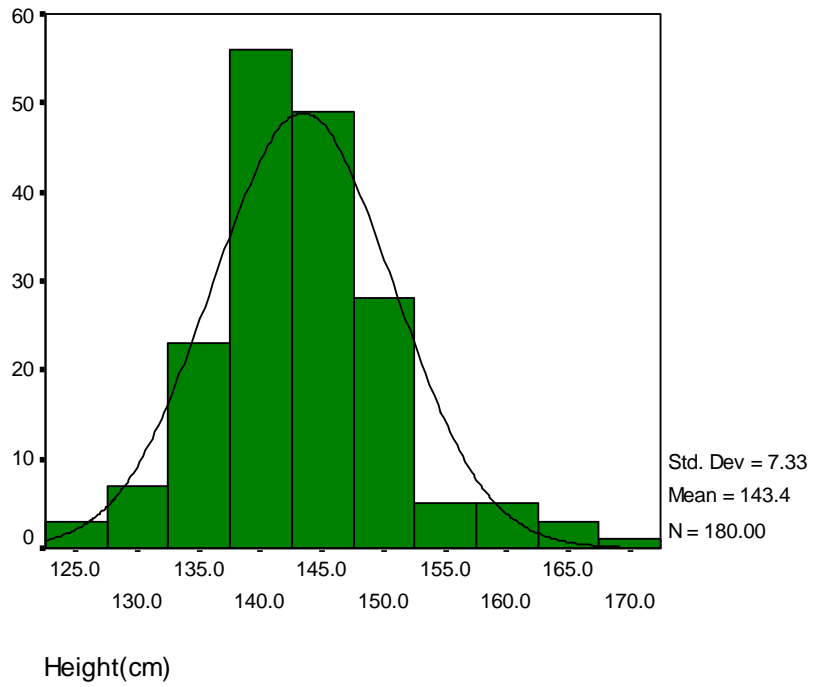
### 1- Fourth Primary Male



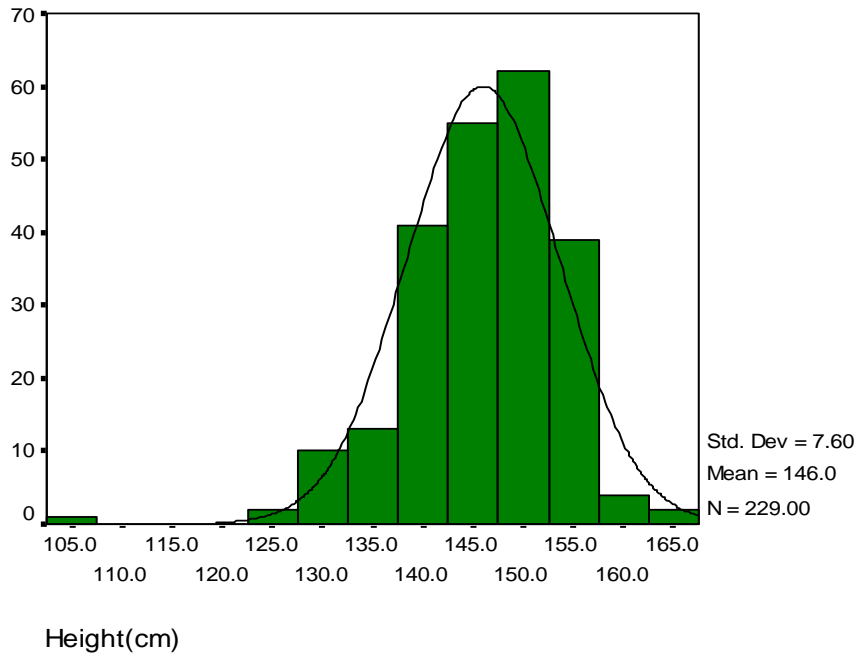
### 2- Fourth Primary Female



### 3- First Preparatory Male



### 4- First Preparatory Female

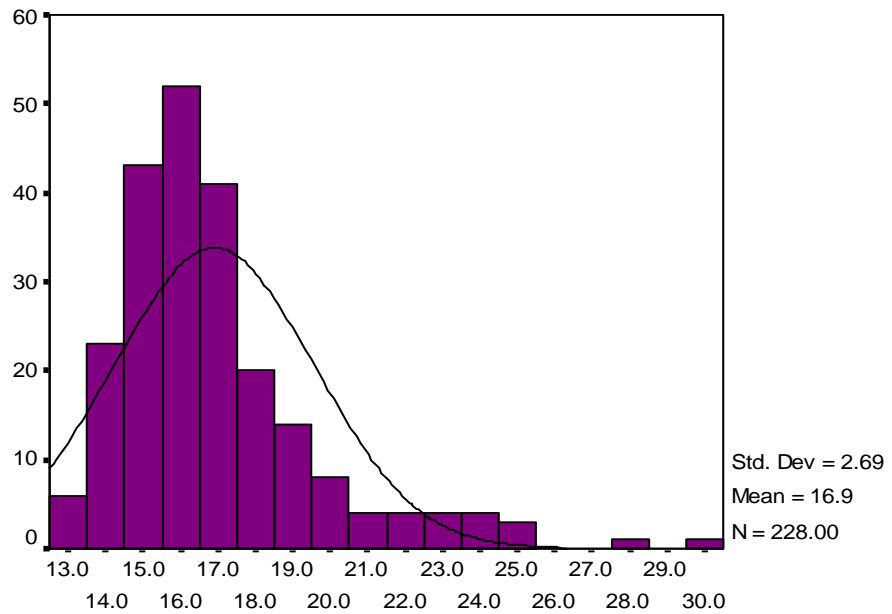


**Table (6)****Body Mass Indices (BMIs) of Different Groups Compared with International and National Standards**

<b>Primary (4<sup>th</sup> year)</b>	<b>Mean BMI -/+SD</b>	<b>Median</b>	<b>International corresponding value (NCHS)</b>	<b>National corresponding value (ASCE)</b>	<b>Minia/international %</b>	<b>Minia/National %</b>	<b>Estimated Percentage under international P3</b>	<b>Estimated Percentage above international P 95</b>
Male (n= 228)	16.90 +/- 2.69	16.32	16.52	17.02	98.8	99.3	5.7	7.0
Female (n=182)	17.00 +/- 2.90	16.34	16.72	16.76	97.7	101.6	5.5	1.6
<b>Preparatory (1st year)</b>								
Male (n= 180)	17.84+/- 2.81	17.36	18.25	18.44	95.1	96.7	9.4	1.1
Female (n= 229)	19.10 +/- 3.73	18.51	18.68	21.06	99.1	90.7	7.9	3.1

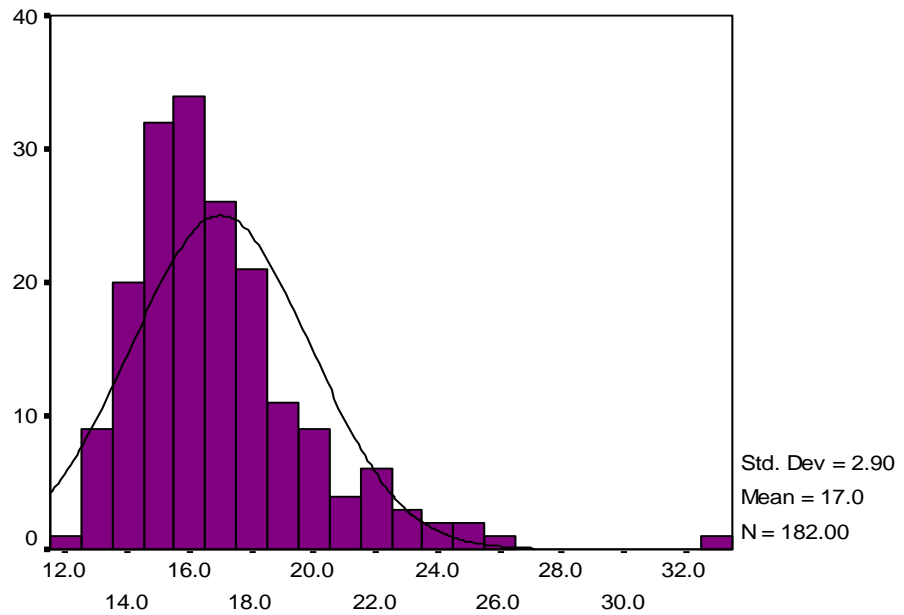
## Body Mass Indices of Students

### 1- Fourth Primary Male



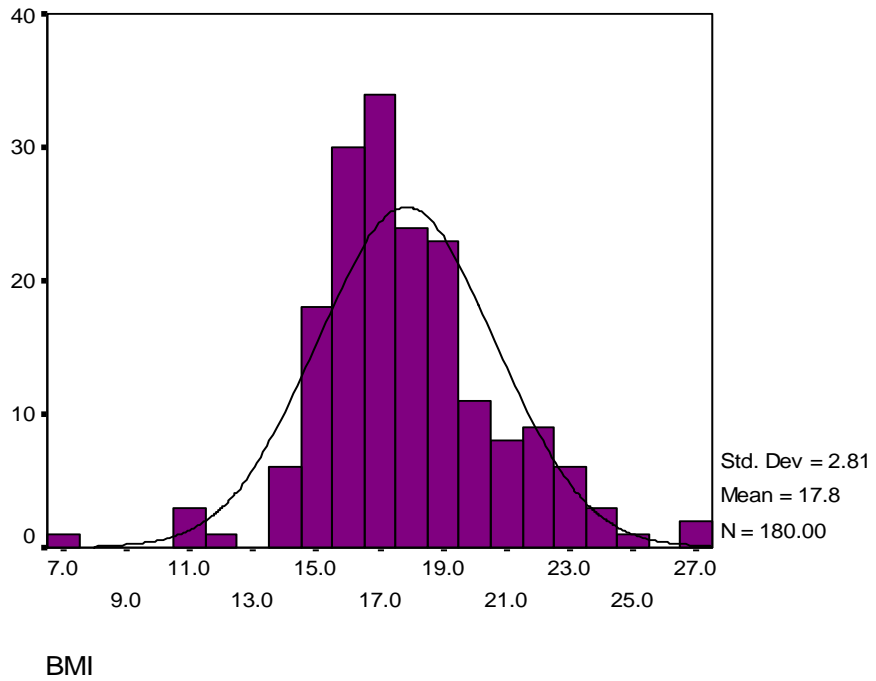
BMI

### 2- Fourth Primary Female

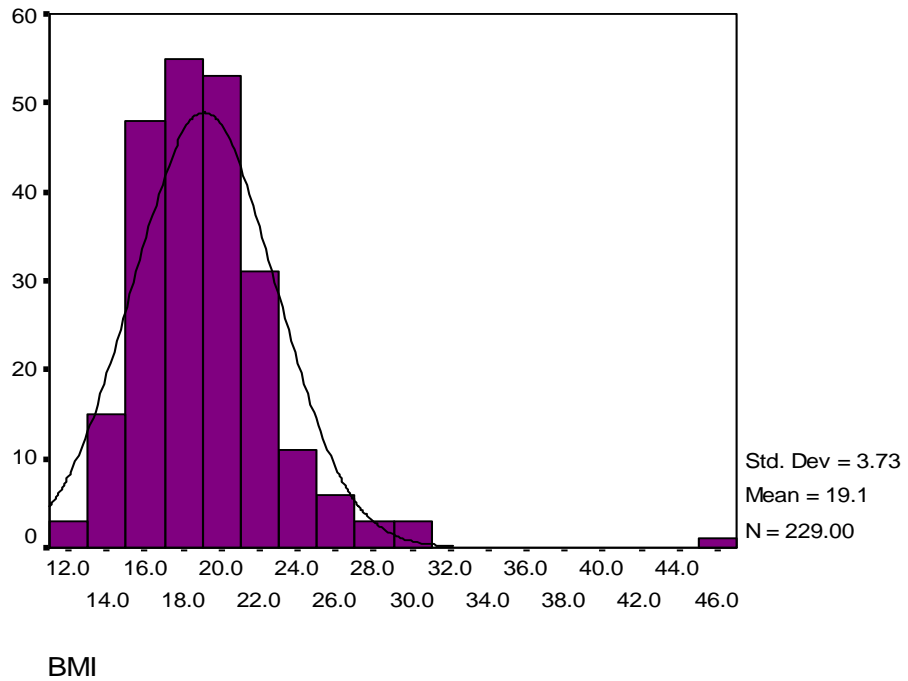


BMI

### 3- First Preparatory Male



### 4- First Preparatory Female



**Table (7)**  
**Urine Analysis Findings**

Findings (% of examined students)	Primary (4 <sup>th</sup> year)		Preparatory (1 <sup>st</sup> year)		Total (N=648 )
	Male (N= 194 )	Female (N= 170 )	Male (N= 138 )	Female (N= 146 )	
Bilharzia Ova in urine	10.3	6.5	5.1	4.8	6.9

**N.B.:** Urine analysis has been done for 648 cases only representing 78.5 % of the study subjects.

**Table (8)**  
**Stool Examination Findings**

Findings (% of examined students)	Primary (4 <sup>th</sup> year)		Preparatory (1 <sup>st</sup> year)		Total (N= 469 )
	Male (N= 144 )	Female (N= 95 )	Male (N= 112 )	Female (N= 118 )	
Oxyuris ova	32.6	32.6	38.4	39.0	35.6
Oxyuris worms	2.8	-	-	0.8	1.1
Entameba Cysts	22.2	20.0	20.5	23.7	21.7
Ascaris ova	2.1	3.2	0.9	-	1.5
Hymenolyis nana ova	1.4	2.1	-	-	0.9
Free	38.9	42.1	44.6	36.6	39.2

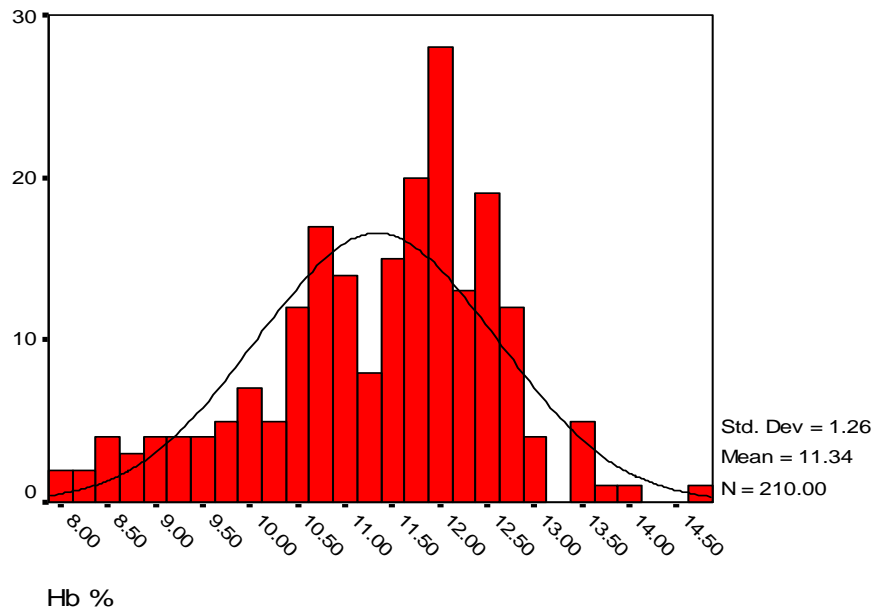
**N.B.:** Stool Examination has been done for 469 cases representing 56.8 % of the study subjects

**Table (9)**  
**Hemoglobin levels of different groups (gm/dl)**

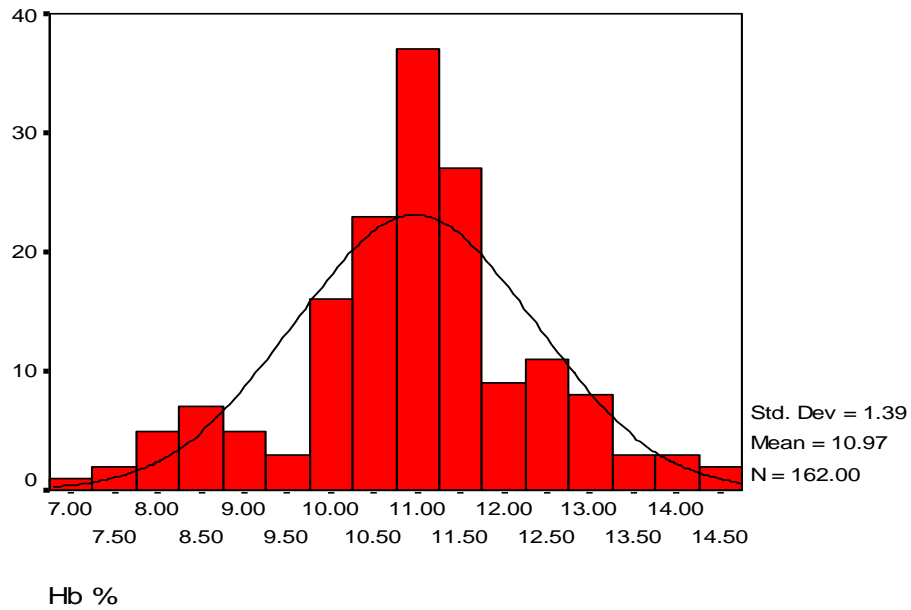
<b>Primary (4<sup>th</sup> year)</b>	<b>Mean hemoglobin level (gm/dl) -/+SD</b>	<b>Median</b>	<b>% below 12 gm/dl</b>	<b>Corresponding national percentage (ASCE)</b>
Male (n= 210)	11.3 +/- 1.3	11.6	63.8	53.2
Female (n=162)	11.0 +/- 1.4	11.0	80.9	46.5
<b>Preparatory (1st year)</b>				
Male (n= 152)	11.8 +/- 1.1	12.0	49.3	53.1
Female (n= 204)	12.0 +/- 1.0	12.00	45.6	48.0

## Hemoglobin Levels of Students

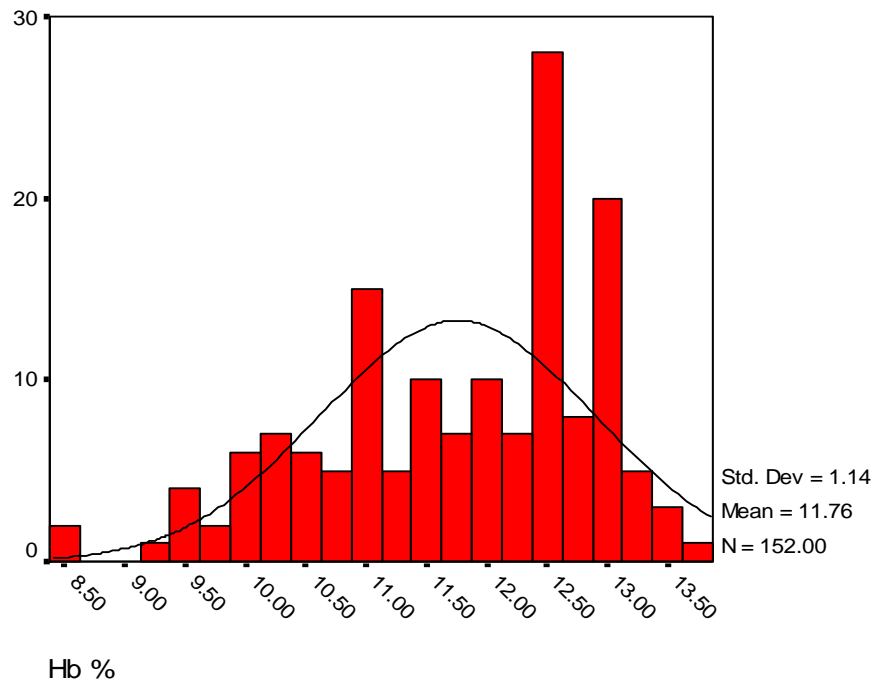
### 1- Fourth Primary Male



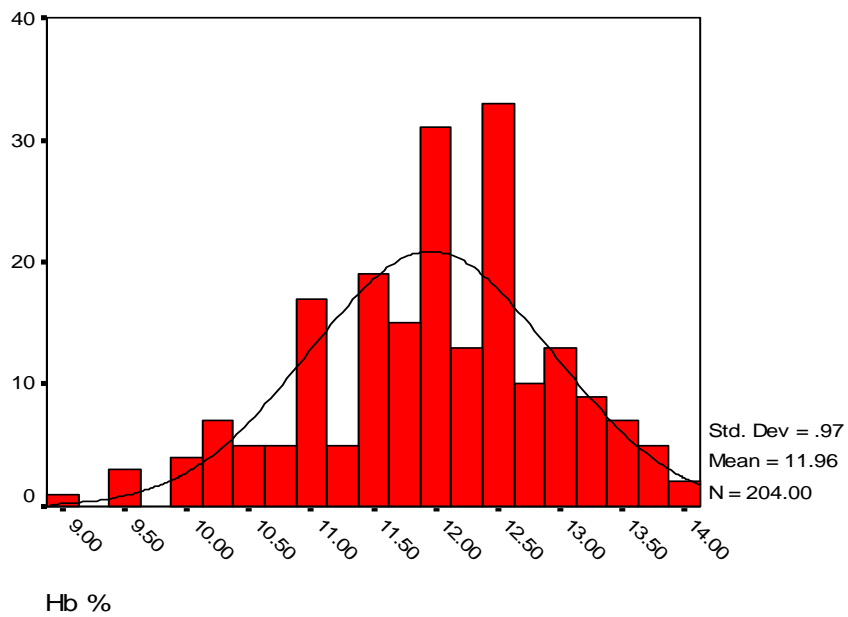
### 2- Fourth Primary Female



### 3- First Preparatory Male

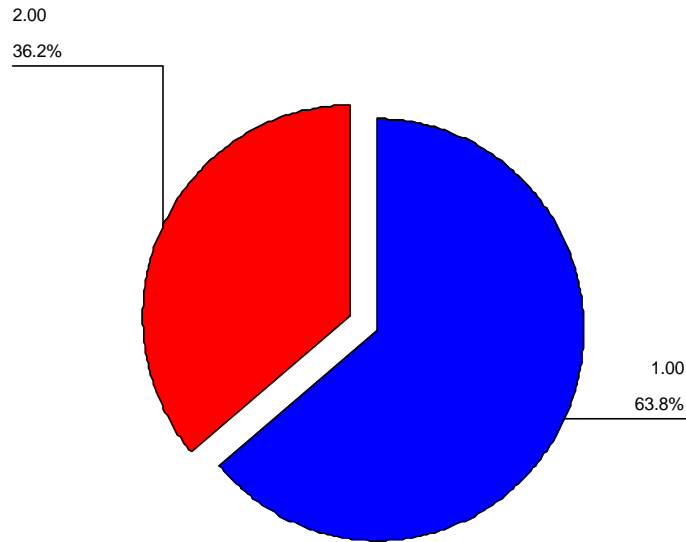


### 4- First Preparatory Female

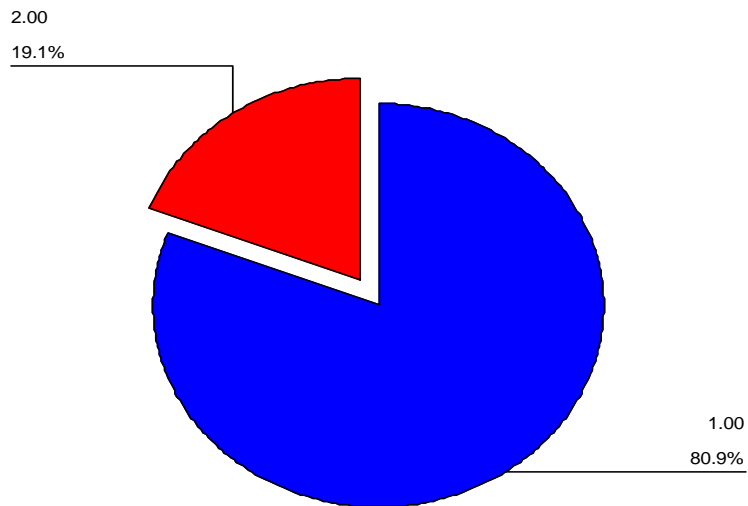


### Percentage of anemics

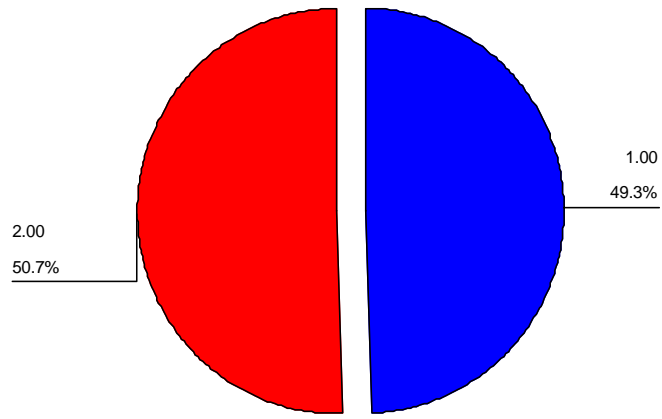
#### 1- Fourth Primary Male



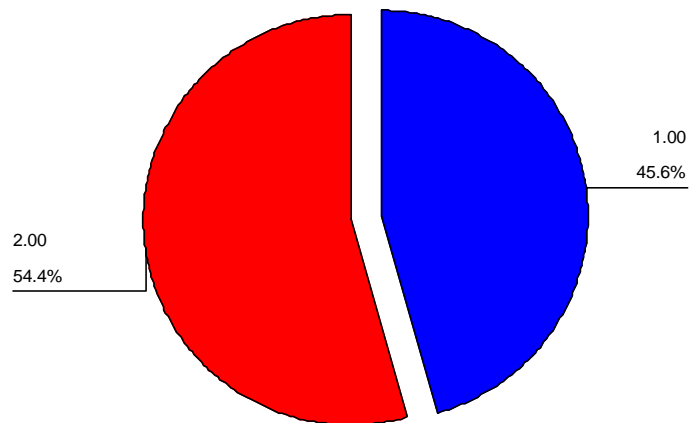
#### 2- Fourth Primary Female



### 3- First Preparatory Male



### 4- First Preparatory Female



### **Section III**

## **Knowledge, Preferences and Practices**

### **of the Survey Sample of Students**

Tables ( 10-14) show the pattern of knowledge, preferences and practices among the surveyed sample of primary and preparatory students. This section of the survey was carried out on 788 students who already have had medical examination. A small number of students (38 representing 4.6% of the original sample of 826 students) were not available for this section, since they left school immediately after medical interview, examination and laboratory tests.

Results showed a mix of positive and negative findings.

Most respondents (79.4%) used to have breakfast daily, and almost the same percentage (79.3%) had breakfast actually on the day of the interview. About two-fifths (38.3%) had sandwiches with them at school, the sandwich bread was usually of the common (Balady) type (70% of those who had sandwiches) and in most cases the filling was broad beans or falafel (bean cakes) (70%). Sandwiches could be brought from home or bought from outside (in about half of the cases: 48.5%). Again, about half of the students (49.3%) used to buy food from street vendors.

The prominent items for the breakfast meal were beans or derivatives such as falafel (43.7%) only a minority had access to animal protein items, the most important of which were: milk (16.4%), eggs (5.4%), keshk (wheat-based milky pellets) (5.0%) and cheese (3.7%).

The main lunch items were rice (22.1%), cooked vegetables (20.4%), salad (20.4%), meat (20.4%) and potatoes (16.8%). Only 3.2% consumed fish. Bread consumption at lunch was universal, 83.5% mentioned it. Most probably, the remainder failed to mention it, since they felt that it was taken for granted.

After lunch, the majority (60.7%) drank tea and only 9.8% had fruits as dessert (Table 10-bottom).

For dinner (evening meal), the more frequent items were: cooked vegetables (21.9%), rice (21.6%) and meat (18.4%), remarkably similar to those of lunch, perhaps reflecting the possibility that left-over food for lunch was used for dinner.

When asked about the meaning of malnutrition, most primary school students responded that they did not know (88.4% among boys and 89.4% among girls). Those few students who ventured to give an answer, just told the obvious “not well nourished” or “one feels weak”. Similar findings were obtained for preparatory students, but about half of them preferred to give those “obvious definitions”.

When asked about food items providing energy, the same items were mentioned by all groups: milk, meat, eggs, and cheese: This is consistent with prevailing culture. In such a poor community, expensive diet items of animal source are highly appreciated and thought to be highly beneficial for all purposes. This is evident from responses to subsequent questions. For example, when asked about food items protecting from disease, milk and meat were mentioned first and only a minority mentioned fruits and vegetables ranked after milk and meat. With regard to food sources of different nutrients, answers were influenced by popular culture and direct impressions rather than regular systematic teaching at school. For food items containing protein they mentioned milk, meat, eggs, cheese, and ranking after them were beans, since it is a popular belief that beans can replace meat (partially). For foods containing fats, “greasy” items were mentioned, e.g., meat, chicken, butter and oil. For foods rich in salt, tomatoes came first for all subgroups. It is a popular belief, that renal stone patients have to abstain from tomatoes, since they are rich in salts “amlah”. With regard to food items rich in vitamins, they mentioned again animal items first, followed by fruits and beans. Animal items are thought to confer vitality, so they are supposed to be rich in vitamins.

Responses to health benefits of different nutrients was quite non-specific (“strengthening the body, protecting from disease, etc), given for almost all food groups. Specific answers, such as “useful for bones and teeth” with regard to calcium, were an exception.

Answers concerning foods causing tooth decay, were quite satisfactory. The vast majority (more than 90%) mentioned sweets, again a popular belief rather than a school acquired item of knowledge.

**Table (10)**  
**Nutritional Practices of the Survey Sample**

Nutritional practices (as % of respondents)	Primary (4 <sup>th</sup> year)		Preparatory (1 <sup>st</sup> year)		Total (N=788 )
	Male (N=208 )	Female (N=176 )	Male (N=178 )	Female (N=226 )	
<b>Usually gets breakfast</b>	78.2	78.9	81.4	79.2	79.4
<b>Had breakfast on the day of interview</b>	80.1	78.1	81.0	78.2	79.3
<b>Has got sandwiches on day of interview</b>	32.8	46.3	37.0	37.9	38.3
<b>Type of bread for sandwiches (% of those who had sandwiches)</b>					
Balady	70.5	80.8	94.9	81.3	81.7
Fino	29.5	19.2	3.4	17.3	17.5
<b>Type of filling for sandwiches</b>					
Beans and Falafel	66.7	71.2	77.6	67.6	70.6
Eggs	12.3	6.8	5.2	5.4	7.3
Cheese	10.5	15.1	5.2	6.8	9.6
<b>Buying not-home-made sandwiches</b>	56.2	49.7	48.8	40.5	48.5
<b>Buying food from street vendors</b>	55.0	54.0	42.9	45.4	49.3
<b>Beverages or dessert items taken after lunch</b>					
Tea	69.7	52.8	71.3	50.0	60.7
Fruits	5.3	10.8	10.1	14.6	9.8
Cold drinks (soda)	4.8	8.0	2.8	2.2	4.3
Sweets	1.9	8.5	4.5	4.0	4.7

**Table (11)**  
**Items consumed for Breakfast on the Day before Interview**  
**(Most Frequent Responses)**

Item	No.	% of respondents
Bread	258	47.6
Beans or Falafel (Bean cakes)	237	43.7
Tea	117	21.6
Milk	89	16.4
Eggs	32	5.9
Biscuits/Cakes	29	5.4
Potatoes	29	5.4
Keshk (wheat based milky pellets)	27	5.0
Cheese	20	3.7
Macaroni	8	1.5
Total number of respondents	542	100

- Only 542 (69.0 % of interviewed children) reported having breakfast on the day before interview.
- Respondents usually reported more than one item for breakfast; therefore the sum of percentages exceeds 100%.

**Table (12)**  
**Items Consumed for Lunch on the Day before Interview**  
**(Most Frequent Responses)**

<b>Item</b>	<b>No.</b>	<b>% of respondents</b>
Bread	555	83.5
Rice	147	22.1
Cooked Vegetables	136	20.4
Salad	135	20.4
Meat	135	20.4
Potatoes	112	16.8
Cheese	105	15.8
Beans or falafel (bean cakes)	80	12.0
Chicken	49	7.4
Macaroni	34	5.1
Fish	21	3.2
Molokhia (Jew's mallow)	13	2.0
Lentils/Koshary (mix of rice and lentils)	6	0.9
Processed meat (Luncheon/sausage)	6	0.9
Total number of respondents	665	100

- Only 665 (84.3 % of interviewed children) reported having lunch on the day before interview.
- Respondents usually reported more than one item for lunch; therefore the sum of percentages exceeds 100%.

**Table (13)**  
**Items Consumed for Dinner on the Day before Interview**  
**(Most Frequent Responses)**

Item	No.	% of respondents
Bread	500	72.0
Cooked Vegetables	152	21.9
Rice	150	21.6
Meat	128	18.4
Beans or falafel (bean cakes)	102	14.7
Potatoes	82	11.8
Cheese	76	11.0
Cabbage /Eggplant / rice stuffed vegetables	65	9.4
Macaroni	63	9.1
Chicken	48	6.9
Milk	15	3.6
Fish	19	2.7
Salad	19	2.7
Fruits	13	1.87
Molokhia (Jew's mallow)	12	1.7
Jam or halava	12	1.7
Honey/molass	5	0.7
Total number of respondents	694	100

- Only 694 (88.0 % of interviewed children) reported having dinner on the day before interview.
- Respondents usually reported more than one item for dinner; therefore the sum of percentages exceeds 100%.

**Table (14)**  
**Nutritional Knowledge Items**  
**Among Surveyed Students**

Nutritional knowledge (ranked responses)	Primary (4 <sup>th</sup> year)		Preparatory (1 <sup>st</sup> year)	
	Male (N=208 )	Female (N=176 )	Male (N=178 )	Female (N=226 )
<b>Meaning of malnutrition</b>				
	1. Not well nourished	1. Not well nourished	1. Not well nourished	1. Not well nourished
	2. One feels weak	2. One feels weak	*	*
	*	*		
Do not Know %	88.4	89.4	48.4	44.1
<b>Food items providing energy</b>				
	1. Milk	1. Eggs	1. Milk	1. Meat
	2. Meat	2. Milk	2. Meat	2. Milk
	3. Eggs	3. Meat	3. eggs	3. Eggs
	4. Cheese	4. Cheese	4. Cheese	4. Cheese
	*	*	*	*
Do not know %	43.9	45.6	13.2	13.9
<b>Food items protecting from diseases</b>				
	1. Milk	1. Milk	1. Meat	1. Meat
	2. Meat	2. Meat	2. Milk	2. Milk
	3. Fruits	3. Fruits	3. Fruits	3. Eggs
	4. Vegetables	4. Eggs	4. Vegetables	4. Vegetables
	*	*	*	*
Do not know %	54.3	60.0	24.5	27.5
<b>Health benefits of vitamin A</b>				
	1. Strengthens body	1. Strengthens body	1. Strengthens body	1. Strengthens body
	2. Supplies Energy	2. Supplies Energy	2. Supplies Energy	2. Protects from diseases
	3. Protects from diseases	*	*	3. Supplies Energy
	*			*
Do not know %	87.6	91.3	58.8	66.0
<b>Food sources of vitamin A</b>				
	1. Milk	1. Eggs	1. Milk	1. Milk
	2. Meat	2. Meat	2. Meat	2. Meat
	*	*	3. Fruits	3. Eggs
			4. Beans	*
			*	
Do not know %	78.3	90.6	61.7	69.0
<b>Health benefits of vitamin C</b>				
	1. Strengthens body	1. Strengthens body	1. Strengthens body	1. Strengthens body
	2. Protects from diseases	2. Protects from diseases	2. Protects from diseases	2. Protects from diseases
	*	*	*	*
Do not know %	92.2	93.4	67.8	80.3

Nutritional knowledge (ranked responses)	Primary (4 <sup>th</sup> year)		Preparatory (1 <sup>st</sup> year)	
	Male (N=208 )	Female (N=176 )	Male (N=178 )	Female (N=226 )
<b>Food sources of vitamin C</b>				
	1. Cheese	*	1. Orange	1. Fruits
	2. Milk		2. Fruits	2. Eggs
	*		3. Milk	3. Meat
			4. Meat	*
			*	
Do not know %	82.8	91.2	67.5	74.8
<b>Health benefits of iron</b>				
	1. Strengthens body	1. Strengthens body	1. Strengthens body	1. Strengthens body
	*	*	2. Supplies Energy	2. Supplies Energy
			*	*
Do not know %	82.7	88.6	41.6	49.1
<b>Food sources of iron</b>				
	1. Meat	1. Eggs	1. Milk	1. Meat
	2. Milk	2. Vegetables	2. Meat	2. Spinach
	*	3. Meat	*	3. Milk
		*		4. Beans
				*
Do not know %	82.1	86.3	52.1	50.6
<b>Health benefits of calcium</b>				
	1. Strengthens body	1. Protects from diseases	1. Strengthens body	1. Strengthens body
	2. Protects from diseases	*	2. Strengthens bones and teeth	2. Supplies Energy
	3. Supplies Energy		3. Protects from diseases	3. Strengthens bones and teeth
	*		*	*
Do not know %	86.9	94.2	48.1	53.7
<b>Food sources of calcium</b>				
	1. Milk	1. Milk	1. Milk	1. Milk
	2. Cheese	2. Cheese	2. Cheese	2. Cheese
	3. Vegetables	3. Eggs	3. Eggs	3. Eggs
	*	*	4. Fish	4. Fish
			*	*
Do not know %	80.1	88.6	51.2	51.9
<b>Food items containing sugar or carbohydrates</b>				
	1. Sweets Pudding	1. Sweets Pudding	1. Rice	1. Rice
	2. Jam	*	2. Sweets	2. Sweets
	*		3. Bread	3. Bread
			4. Potatoes	4. Potatoes
			5. Macaroni	5. Macaroni
			*	*
Do not know %	38.3	35.1	11.0	8.2

\* Other choices not contributing meaningfully to ranking because of their low numbers.

Nutritional knowledge (ranked responses)	Primary (4 <sup>th</sup> year)		Preparatory (1 <sup>st</sup> year)	
	Male (N=208 )	Female (N=176 )	Male (N=178 )	Female (N=226 )
<b>Food items containing proteins</b>				
	1. Eggs	1. Meat	1. Meat	1. Meat
	2. Milk	2. Milk	2. Milk	2. Milk
	3. Meat	3. Chicken	3. Beans	3. Eggs
	4. Cheese	4. Eggs	4. Eggs	4. Beans
	*	*	*	*
Do not know %	68.5	69.8	28.0	26.6
<b>Food items containing fats</b>				
	1. Meat	1. Meat	1. Meat	1. Meat
	2. Chicken	2. Chicken	2. Butter	2. Chicken
	3. Oils	3. Butter	3. Oils	3. Oils
	*	*	*	*
Do not know %	45.3	40.4	14.9	11.6
<b>Food items containing mineral salts</b>				
	1. Tomatoes	1. Tomatoes	1. Tomatoes	1. Tomatoes
	2. Cooked vegetables	2. Cheese	2. Cheese	2. Cheese
	3. Meat	*	*	*
	*			
Do not know %	71.8	67.9	41.8	43.9
<b>Food items containing vitamins</b>				
	1. Milk	1. Eggs	1. Meat	1. Meat
	2. Eggs	2. Meat	2. Milk	2. Milk
	3. Cheese	3. Milk	3. Beans	3. Fruits
	4. Meat	4. Fruits	*	4. Beans
	5. Fruits	5. Cheese		*
	*	*		
Do not know %	64.1	82.9	24.6	31.8
<b>Food items causing teeth decay</b>				
	1. Sweets	1. Sweets	1. Sweets	1. Sweets
	*	*	*	*
Do not know %	3.2	5.1	2.5	3.4
<b>Diseases causing teeth decay</b>				
	1. Malnutrition	1. Malnutrition	1. Malnutrition	1. Malnutrition
	2. Infectious diseases	2. Infectious diseases	2. Infectious diseases	2. Infectious diseases
	*	*	*	*
Do not know %	41.7	57.2	32.9	39.5

\* Other choices not contributing meaningfully to ranking because of their low numbers.

## Section IV

### Nutritional Knowledge, Preferences and Practices of the Survey Sample of Health Care Providers

The health care providers included in this survey were, 22 physicians, 50 nurses and 11 lab technicians (including 5 assistant” lab technicians, assigned the same duties as lab technicians), all working at the primary care level.

The median value for years of experience was 4 years for physicians (whereas the mean was 10.6 because of few cases with long experience), the mean for nurses and lab technicians was 14.6 and 15.6 years respectively (Table 15).

For most knowledge items (Table 16) the answers were correct (the best answers were given by physicians, followed by nurses and laboratory technicians) and few expressed that they did not know the answer (except for the importance of iodine and its sources). It is remarkable, that for almost all knowledge items, almost the same responses were given and in the same ranking, expressing a common culture.

It is noteworthy that knowledge, though correct in general, is quite deficient. The importance of vitamin A for good vision was the only benefit of vitamin A, that most respondents (including physicians) could recall. Carrots were the only source for vitamin A that most health care providers mentioned. Few referred to vegetables and even a smaller number mentioned any animal source.

With regard to the malnutrition concept, the first ranking response was lack of balance in diet and excessive food intake reflecting awareness that “diet is quality not just quantity” and that “obesity is hazardous, perhaps more than cachexia”

With regard to hygienic specifications for choosing foods (vegetables, fruits, meat, milk and fish), the foremost criterion was being fresh, usually assessed by smell, the second criterion was brightness and luster (Table 17).

Concerning Knowledge about breast feeding (Table 18), almost all physicians, but a minority of nurses and lab technicians heard about exclusive breast feeding. The majority were of the opinion that water and fluids may be given concurrently with exclusive breast feeding.

A positive finding is that the majority of health care providers were of the opinion that breast feeding is to be on demand, not prescheduled.

An unfortunate finding was that a large percentage of physicians (36.3%) advocated giving extra food before the sixth month, the corresponding percentage for nurses was 14.0% perhaps reflecting local culture emphasizing the importance of breast feeding.

More than 90% of physicians stated that iodine is the element needed by the thyroid to synthesize its hormone, but the corresponding percentages for nurses and lab technicians were 70.0% and 27.3% respectively.

More than 95% of physicians (80.0% of nurses and 54.5% of lab technicians) admitted that iodized salt protects children from mental and growth retardation.

Most physicians (72.7%) know how to test cooking salt for iodine (through adding it to a starchy substance), but only 42.0% of nurses and 54.5% of lab technicians had similar knowledge.

**Table (15)****Characteristics of the survey health care providers**

<b>Characteristic</b>	<b>Physicians</b>	<b>Nurses</b>	<b>Lab Technicians and assistants</b>
	(N= 22 )	(N= 50 )	(N= 11 )
<b>Sex:</b>			
(Male %)	68.2	16.0	63.6
(Female %)	31.8	84.0	36.4
<b>Years of experience</b> (X +/- SD)	10.6 +/- 9.9	14.6 +/- 10.5	15.6 +/- 6.7

**Table (16)**  
**Knowledge Items Among Surveyed Health Care Providers**  
**Concerning Different Food Groups**  
**and Malnutrition Concept**

Knowledge item (choices ranked)	Physicians	Nurses	Lab Technicians
	(N= 22 )	(N= 50 )	(N= 11 )
<b>Foods providing energy</b>			
	1. Rice	1. Rice	1. Potatoes
	2. Sweets	2. Sweets	2. Sweets
	3. Potatoes	3. Bread	3. Eggs
	4. Bread	4. Potatoes	*
	*	*	
Do not know %	-	-	-
<b>Foods for growth and body building</b>			
	1. Meat	1. Meat	1. Meat
	2. Fish	2. Eggs	2. Fish
	3. Eggs	3. Fish	*
	4. Cheese	4. Cheese	
	*	*	
Do not know %	-	-	-
<b>Foods protecting the body</b>			
	1. Fruits	1. Fruits	1. Fruits
	2. Vegetables	2. Vegetables	2. Vegetables
	*	*	*
Do not know %	-	-	-
<b>Importance of vitamin A for health</b>			
	1.Important for good vision	1.Important for good vision	1.Important for good vision
	2. Important for skin health	*	*
	*		
Do not know %	-	4.0	9.1
<b>Food Sources of vitamin A</b>			
	1. Carrots	1. Carrots	1. Vegetables
	*	2. Vegetables	2. Carrots
		*	*
Do not know %	4.5	14.0	9.1

\* Other choices not contributing meaningfully to ranking because of their low numbers

Knowledge item (choices ranked)	Physicians	Nurses	Lab Technicians
	(N= 22 )	(N= 50 )	(N= 11 )
<b>Importance of vitamin C for health</b>	Protects from diseases	Protects from influenza	Protects from diseases
	*	*	*
Do not know %	26.5	60.2	13.3
<b>Food Sources of vitamin C</b>			
	1. Orange	1. Orange	1. Orange
	2. Lemon	2. Lemon	2. Lemon
	*	*	*
Do not know %	-	10.0	7.2
<b>Importance of iron for health</b>			
	1. Protects from anemia	1. Protects from anemia	1. Protects from anemia
	*	*	*
Do not know %	-	6.0	-
<b>Food Sources of iron</b>			
	1. Spinach	1. Spinach	1. Spinach
	2. Liver	2. Liver	2. Liver
	3. Molass	3. Molass	3. Molass
	4. Eggplant	4. Eggplant	4. Eggplant
	*	*	*
Do not know %	-	-	-
<b>Importance of calcium for health</b>			
	1. To strengthen bones and teeth	1. To strengthen bones and teeth	1. To strengthen bones and teeth
	*	*	*
Do not know %	-	-	-
<b>Food Sources of calcium</b>			
	1. Milk	1. Milk	1. Eggs
	2. Cheese	2. Eggs	2. Milk
	3. Eggs	3. Cheese	3. Fish
	*	4. Fish	*
		*	
Do not know %	-	-	-
<b>Importance of iodine for health</b>			
	1. For proper function of thyroid gland	1. For proper function of thyroid gland	1. For proper function of thyroid gland
	*	*	*
Do not know %	-	18.0	27.3
<b>Food Sources of iodine</b>			
	1. Salt	1. Salt	1. Salt
	2. Fish	2. Fish	2. Fish
	*	*	*
Do not know %	-	10.0	27.3

\* Other choices not contributing meaningfully to ranking because of their low numbers

Knowledge item (choices ranked)	Physicians	Nurses	Lab Technicians
	(N= 22 )	(N= 50 )	(N= 11 )
<b>Meaning of malnutrition</b>			
	1. Limited food varieties	1. Limited food varieties	1. Limited food varieties
	2. Excessive food intake	2. Excessive food intake	2. Excessive food intake
	*	*	*
Do not know %	9.1	22.0	-

\* Other choices not contributing meaningfully to ranking because of their low numbers.

**Table (17)**  
**Specifications for Choosing Foods**  
**So as to be Fit for Health**

Food Group	Physicians	Nurses	Lab Technicians
	(N= 22 )	(N= 50 )	(N= 11 )
<b>Vegetables &amp; Fruits</b>			
	1.Fresh	1.Fresh	1.Fresh
	2. Bright colour (luster)	2. Bright colour (luster)	*
	*	*	
Do not know %	-	-	-
<b>Meat</b>			
	1. Smelling good	1. Bright colour	1. Bright colour
	2. Bright colour	2. Smelling good	2. Smelling good
	*	*	*
Do not know %	-	-	-
<b>Milk</b>			
	1. Normal colour	1. Normal colour	1. Normal colour
	2. Smells fresh	2. Smells fresh	2. Smells fresh
	*	*	*
Do not know %	-	2.0	-
<b>Fish</b>			
	1. Bright gills	1. Bright gills	1. Bright gills
	2. Smells good	*	*
	*		
Do not know %	-	6.0	9.1

\* Other choices not contributing meaningfully to ranking because of their low numbers.

**Table (18)**  
**Knowledge about Breast-Feeding**

Knowledge item (as % of respondents)	Physicians	Nurses	Lab Technicians
	(N= 22 )	(N= 50 )	(N= 11 )
<b>Heard about exclusive breast feeding</b>			
	95.5	26.0	36.4
<b>Water should not be given with exclusive breast feeding</b>			
	59.1	77.1	14.3
<b>Fluids should not be given with exclusive breast feeding</b>			
	72.7	81.3	-
<b>Breast feeding is to be on demand not prescheduled</b>			
	86.4	96.0	63.6
<b>Age in months to start giving extra food with breast feeding</b>			
First month	-	-	-
Second month	-	-	-
Third month	-	4.0	9.1
Fourth month	31.8	4.0	14.5
Fifth month	4.5	6.0	6.0
Sixth month	45.5	76.0	63.9
Seventh month	9.1	6.0	6.0
Eighth month or more	9.0	4.0	9.1

**Table (19)**  
**Knowledge about Iodine**

Knowledge item (as % of respondents)	Physicians	Nurses	Lab Technicians
	(N= 22 )	(N= 50 )	(N= 11 )
<b>Element needed by thyroid to synthesize its hormone</b>			
Iodine	90.9	70.0	27.3
<b>Does iodized salt protect children from mental retardation and growth retardation</b>			
Yes	95.5	80.0	54.5
<b>How to test salt for iodine content</b>			
Adding to starchy substance	72.7	42.0	54.5

## **Section V**

### **Nutritional Awareness, Preferences and Practices of Community Members**

The characteristics of interviewed community members are shown in Table (20). They were a mix of males and females (40.2% and 59.9% respectively) of various educational levels (about one third illiterate, another third of intermediate education and about one fifth of higher education), various jobs and occupations (shown in Table 20-a for persons other, than housewives or teachers).

For most knowledge items, answers were correct in general, but mostly insufficient (Table 21). The best answers were given by teachers (quite excepted). As with other categories of respondents in previous sections ,meat, eggs, milk and dairy products (expensive highly appreciated food items of animal origin) are ubiquitously cited as foods “providing energy” besides the carbohydrate rich foods such as bread and potatoes.

In contradistinction to health care providers, the first ranking definition for malnutrition was intake of quantities less than needed, followed by limited food variety. (with the exception of teachers, where the same two definitions are given but the ranking reversed. Very few, including teachers, referred to overeating as malnutrition.

The major hygienic criteria for choosing food (vegetables, fruits, meat, milk and fish) were being fresh (usually equated with good smell), lustrous colour and good appearance. These are the same as mentioned by categories in former sections (school students and health care providers). However, a new criterion has been added by the group of community members, the food item being supplied by a trustworthy vendor (butcher, milkman, fruit-seller, etc).

In traditional communities, the element of personal trust always ranks high and may be decisive in life decisions, whether of major or minor importance.

With regard to nutritional knowledge items (Table 23) presented as True/False/ Do not know choices, housewives would obtain an average total score of 62.5%, teachers would obtain 77.1% and other community members would get 69.8%. This reflects a relatively acceptable level of knowledge with regard to tested items. Many of these items have been often discussed through mass media, this might explain the relatively satisfactory scores and the narrow differences between various categories. With regard to preferences and practices of housewives, almost half of them preferred to store food (pickles, honey, jam,

etc) in plastic containers, and slightly less than half used glass containers, very few mentioned other kinds of containers.

The use of aluminum containers for cooking was almost universal (92.8%). The vast majority preferred to wash vegetables with water only (86.9%) and the majority used to boil milk once, just after buying it (68.7%). The vast majority (90.5%) used to offer liquid fresh milk to their children, and milk was offered to children mostly non-skimmed (60.1%). Only 56.2% of housewives used to boil milk for more 10 minutes or more.

Most of housewives (79.8%) reported that their children had breakfast before going to school, this is almost the same percentage reported by children in section III.

The most common items for children breakfast were: beans or falafel (bean cakes), milk/dairy products and eggs. For their lunch, children usually had cooked vegetables, potatoes, cheese, and eggs and for dinner they had cooked vegetables, cheese/dairy products, beans or falafel and sometimes meat. These findings are remarkably similar to those mentioned by children in section III of this report, enhancing the belief in the validity of those results.

Meat was served to children 2-3 times per month on the average, and fish once per month. It is the tradition in many villages, to have meat for dinner (or lunch) once per week, either in the form of red meat or poultry or fish. The intake of milk, cheese, vegetables and fruits was usually on a daily basis.

Responses given by teachers and other community members were consistent with those given by housewives, this is quite expected since they were reporting on a common family life. An exception however is noteworthy, only 25.7% and 36.6% of other community members were aware that the salt used at home was iodized whereas 70.8% of teachers knew about this fact. This reflects a difference of awareness, rather than a difference of practice.

**Table (20)****Characteristics of community respondents**

Characteristic	Female Clients to primary care units	Teachers	Other community members	Total
	(N= 275 )	(N= 145 )	(N= 248 )	(N= 668 )
<b>Sex:</b>				
(Male %)	-	77.9	62.9	40.2
(Female %)	100.0	22.1	37.1	59.8
<b>Education</b>				
% Illiterate	61.1	-	25.0	34.4
% Read and Write	16.7	-	22.6	15.3
% Intermediate Education	21.5	25.5	42.7	30.2
% Higher Education	0.7	74.5	9.7	20.1

**Table (20-a)**

**Occupations for the category  
“other community members”**

Occupations	Number
NGOs members	17
Employees	52
Sheikhs /Clergy	7
Village mayor /chiefs	7
Technical/other workers	22
Drivers	6
Farmers	41
Free Trade	17
Others	79
<b>Total</b>	<b>248</b>

**Table (21)**  
**Community members knowledge about**  
**food groups and malnutrition concept**

Knowledge Item	Female Clients to primary care units	Teachers	Other community members
	(N= 275 )	(N= 145 )	(N= 248 )
<b>Foods providing energy</b>			
	1. Milk	1. Bread	1. Meat
	2. Potatoes	2. Potatoes	2. Potatoes
	3. Eggs	3. Meat	3. Eggs
	4. Milk	4. Fish	4. Milk
	*	*	5. Bread
			*
<b>Foods for growth and body building</b>			
	1. Meat	1. Meat	1. Meat
	2. Milk /dairy	2. Fish	2. Milk /dairy
	3. Eggs	3. Eggs	3. Eggs
	*	*	*
<b>Foods protecting body health</b>			
	1. Vegetables	1. Vegetables	1. Vegetables
	2. Milk/dairy	2. Fruits	2. Fruits
	3. Fruits	*	*
	*		
<b>Importance of vitamin A for health</b>			
	1. Strengthens body	1. For good vision	1. For good vision
	2. For good vision	2. Helps to grow	2. Strengthens body
	3. Protects from diseases	3. Strengthens body	3. Helps to grow
	*	*	*
<b>Sources of vitamin A</b>			
	1. Meat	1. Carrots	1. Carrots
	2. Milk	2. Gargir	2. Fruits
	3. Eggs	3. Fruits	3. Gargir
	*	*	*
<b>Importance of vitamin C for health</b>			
	1. Protects from diseases	1. Protects from (influenza)	1. Protects from diseases
	2. Strengthens body	2. Strengthens body	2. Strengthens body
	3. Gives energy	3. Strengthens bones	3. Helps to grow
	*	*	*

\* Other choices not contributing meaningfully to ranking because of their low numbers.

Knowledge Item	Female Clients to primary care units	Teachers	Other community members
	(N= 275 )	(N= 145 )	(N= 248 )
<b>Sources of vitamin C</b>			
	1. Orange	1. Orange	1. Orange
	2. Other fruits	2. Lemon	2. Lemon
	3. Milk	3. Other fruits	3. Other fruits
	*	*	*
<b>Importance of iron for health</b>			
	1. Strengthens body	1. Prevents anemia	1. Strengthens bones
	2. Strengthens bones	2. Strengthens bones	2. Prevents anemia
	3. Protects from diseases	3. Protects from diseases	3. Helps to grow
	*	*	*
<b>Sources of iron</b>			
	1. Eggplant	1. Eggplant	1. Eggplant
	2. Meat	2. Spinach	2. Molass
	3. Spinach	3. Molass	3. Meat
	*	*	4. Spinach
<b>Importance of calcium for health</b>			*
	1. Strengthens bones	1. Strengthens bones	1. Strengthens bones
	2. Strengthens body	2. Helps to grow	2. Strengthens body
	3. Helps to grow	3. Strengthens body	3. Helps to grow
	*	*	*
<b>Sources of calcium</b>			
	1. Milk /dairy	1. Milk /dairy	1. Milk /dairy
	2. Eggs	2. Eggs	2. Eggs
	3. Meat	3. Fish	3. Fish
	*	*	*
<b>Importance of iodine for health</b>			
	1. Protects from diseases	1. For Thyroid function	1. For Thyroid function
	2. Strengthens body	2. Protects from diseases	2. Strengthens body
	3. For Thyroid function	3. Strengthens bones	3. Protects from diseases
	4. Strengthens bones	4. Strengthens body	4. Strengthens bones
	*	*	*
<b>Sources of iodine</b>			
	1. Salt	1. Salt	1. Salt
	2. Fish	2. Fish	2. Fish
	*	*	*
<b>Meaning of malnutrition</b>			
	1. Quantities less than needed	1. Limited variety	1. Quantities less than needed
	2. Limited variety	2. Quantities less than needed	2. Limited variety
	*	*	*

**Table (22)**  
**Specifications for Choosing Foods**  
**so as to be Fit for Health**

Specification Items (most frequent 3 ranked)	Female Clients to primary care units	Teachers	Other community members
	(N= 275 )	(N= 145 )	(N= 248 )
<b>Vegetables &amp; Fruits</b>			
	1. Fresh	1. Fresh	1. Fresh
	2. Clean/Covered	2. Clean/Covered	2. Clean/Covered
	3. Colour & appearance	3. Colour & appearance	3. Colour & appearance
	*	*	*
<b>Meat</b>			
	1. Colour/ Appearance	1. Fresh Smell	1. Colour/ Appearance
	2. Fresh Smell	2. Colour/ Appearance	2. Fresh Smell
	3. Trusted Butcher	3. Trusted Butcher	3. Trusted Butcher
	*	*	*
<b>Milk</b>			
	1. Fresh	1. Fresh	1. Fresh
	2. Clean/Covered	2. Clean/Covered	2. Clean/Covered
	3. Trusted source	3. Trusted source	3. Trusted source
	*	*	*
<b>Fish</b>			
	1. Fresh	1. Fresh	1. Fresh
	2. Rosy gills	2. Rosy gills	2. Rosy gills
	3. Clean/ Covered	3. Trusted source	3. Trusted source
	*	*	*

\* Other choices not contributing meaningfully to ranking because of their low numbers.

Table (23)

## Community Members Knowledge Concerning Certain Statements

Statement (% of respondents)	Female Clients to primary care units	Teachers	Other community members
	(N= 275 )	(N= 145 )	(N= 248 )
<b>White bread is healthier than brown bread</b>			
- True	52.8	25.4	34.8
- False	45.4	73.9	63.6
- Don't know	1.9	0.7	1.6
<b>Fresh food is healthier than preserved food</b>			
- True	91.2	97.2	92.7
- False	6.9	2.8	6.5
- Don't know	1.8	-	0.8
<b>Pickles are harmful to health</b>			
- True	62.9	93.8	72.8
- False	32.7	5.5	24.8
- Don't know	4.4	0.7	2.4
<b>Beans with bread, oil, "tahina", and lemon can substitute meat on your diet</b>			
- True	39.8	61.4	47.4
- False	59.5	37.9	51.8
- Don't know	0.7	0.7	0.8
<b>Drinking tea directly after meals is unhealthy</b>			
- True	74.8	94.5	83.9
- False	22.3	5.5	15.3
- Don't know	2.9	-	0.4
<b>Drinking soda after meals facilitates the digestion process</b>			
- True	70.1	56.9	70.4
- False	21.1	41.0	25.1
- Don't know	8.8	2.1	4.5
<b>Boiled oil can be used twice for frying</b>			
- True	17.5	9.7	10.9
- False	82.2	89.7	88.3
- Don't know	0.4	0.7	0.8

Statement (% of respondents)	Female Clients to primary care units	Teachers	Other community members
	(N= 275 )	(N= 145 )	(N= 248 )
<b>It is preferable to overpeel fruits and vegetables before eating</b>			
- True	46.9	24.1	37.2
- False	47.6	75.2	56.3
- Don't know	5.5	0.7	6.5
<b>It is preferable to cook beans without leaving them in the water for sometime to soften</b>			
- True	36.7	26.9	39.7
- False	62.5	71.7	54.3
- Don't know	0.7	1.4	6.1
<b>Food variability is good for health.</b>			
- True	94.2	99.3	96.0
- False	2.9	0.7	3.6
- Don't know	2.9	-	0.4
<b>Obesity means malnutrition</b>			
- True	29.6	50.3	44.5
- False	43.4	48.3	41.3
- Don't know	27.0	1.4	14.2
<b>There is a relation between adequate nutrition and health</b>			
- True	76.9	98.6	90.7
- False	14.3	0.7	4.5
- Don't know	8.8	0.7	4.9
<b>Artificial additives (such as in colored candies for children) are harmful</b>			
- True	71.2	96.6	81.3
- False	17.9	2.8	12.6
- Don't know	10.6	0.7	6.1

**Table (24)**  
**Community Members Preferences**  
**Concerning Certain Dietary Practices**

Preferences (% of respondents)	Female Clients to primary care units	Teachers	Other community members
	(N= 275 )	(N= 145 )	(N= 248 )
<b>Prefers storing food (such as pickles/honey/jam) in the house in</b>			
- glass containers	43.1	84.0	59.3
- plastic containers	54.0	10.4	34.7
- clay containers	1.4	4.9	4.4
- other (mention)	1.4	0.7	1.6
<b>Cooking containers at home are made of:</b>			
- aluminum	92.8	84.8	90.7
- clay	0.4	-	0.1
- stainless steel	5.8	14.5	7.7
- brass	-	-	0.4
- other	1.1	0.7	1.2
- don't know	-	-	-
<b>Groups of food child prefers (Ranked)</b>			
e.g- Vegetarian foods	1. Fruits	1. Milk //dairy	1. Milk / dairy
- Animal foods (milk, eggs, meat, fish)	2. Milk //dairy	2. Eggs	2. Fruits
- Sugar and sweets	3. Eggs	3. Meat	3. Eggs
	4. Potatoes	4. Fruits	4. Meat
<b>Prefers washing</b>			
- with water only	86.9	55.9	79.4
- with water and soap	2.5	9.0	4.0
- with water and usually leaving it for some time in water and vinegar before serving	2.5	35.2	16.5
<b>Milk is boiled</b>			
- after buying it	68.7	57.9	70.9
- after buying it and each time before serving	29.1	42.1	27.1
- don't know	2.3	-	2.4

**Table (25)**  
**Community Members Dietary and Nutritional Practices**

Preferences (% of respondents)	Female Clients to primary care units	Teachers	Other community members
	(N= 275 )	(N= 145 )	(N= 248 )
<b>Milk is served to children</b>			
- skimmed	39.9	35.3	55.7
- non skimmed or don't know	60.1	64.7	44.3
<b>Time needed to boil milk (minutes)</b>			
- Less than ten minutes	43.8	37.9	42.8
- Ten minutes or more	56.2	62.1	57.2
<b>Child has breakfast before going to school</b>			
- Yes	79.8	88.9	82.6
- No	7.8	7.4	5.8
- Sometimes	9.1	3.7	6.3
<b>Child is offered a variety of food in one meal</b>			
- Yes	65.0	85.2	70.9
- No	14.8	5.9	12.7
- Sometimes	18.5	8.1	14.1
<b>Type of milk offered to children</b>			
- powder milk	5.7	5.8	5.5
- liquid fresh milk	90.5	89.2	92.0
- liquid preserved milk	1.9	5.0	0.8
<b>Salt used at home</b>			
- Iodized	25.7	70.8	36.6
- Not iodized	6.8	4.9	3.7
- Don't know	66.0	24.3	58.8

**Table (26)**  
**Frequency and Composition of Meals of Children of Interviewed**  
**Community Members**

Preferences (% of respondents)	Female Clients to primary care units	Teachers	Other community members
	(N= 275 )	(N= 145 )	(N= 248 )
<b>Number of meals per day (% of respondents)</b>			
- 1	0.6	0.8	-
- 2	6.9	2.4	2.2
- 3	70.1	72.6	74.2
- 4 or more	19.0	24.2	19.2
<b>Breakfast items (most frequent 3 items ranked)</b>			
-	1. Beans or Falafel	1. Beans or Falafel	1. Beans or Falafel
-	2. Milk /dairy	2. Milk /dairy	2. Milk /dairy
-	3. Eggs	3. Eggs	3. Eggs
<b>Lunch items (most frequent 3 items ranked)</b>			
-	1. Cooked vegetables	1. Cooked vegetables	1. Cooked vegetables
-	2. Potatoes	2. Potatoes	2. Potatoes
-	3. Cheese	3. Eggs	3. Cheese
-	4. Eggs	4. Cheese	4. Eggs
<b>Dinner items (most frequent 3 items ranked)</b>			
-	1. Cooked vegetables	1. Cooked vegetables	1. Cheese /dairy
-	2. Cheese /dairy	2. Cheese /dairy	2. Beans or falafel
-	3. Beans or falafel	3. Beans or falafel	3. Cooked vegetables
-	4. Meat	4. Eggs	
<b>Frequency of child intake of</b>			
- Meat (median per month)	2.0	3.0	2.0
- Fish (median per month)	1.0	1.0	1.0
- Eggs (median per week)	5.0	5.0	7.0
- Milk (median per week)	7.0	7.0	7.0
- Cheese (median per week)	12.0	6.0	8.0
- Vegetables (median per day)	1.0	1.0	1.0
- Fruits (median per day)	1.0	1.0	1.0

## **Section VI**

### **Nutritional services provided at the primary care units and Schools\* 1**

#### **Nutritional services provided at the primary care units**

None of the surveyed eight rural primary care units had an educational kitchen facility. Educational kitchens are supposed to provide nutritional guidance to mothers and pregnant women in the art of preparing proper nutritious meals for their families. One of those units had mural educational posters related to anemia and breast feeding. Six of the eight units reported holding nutritional educational sessions for attending mothers (once weekly in 4 units, twice weekly in one unit and once every 2 months in one unit). These sessions are usually conducted by nurses and on few occasions doctors may participate. Simple educational material (leaflets, brochures, etc.) are available for display or distribution at units conducting those nutritional educational sessions.

However, interviewed doctors showed interest in promoting nutrition educational activities. Their main suggestions were:

1. Assigning nutrition education to qualified trained persons (nutritionists).
2. Regular time schedule for nutrition education sessions.
3. Wider availability of nutrition education material.
4. Allocating rooms for establishing educational kitchens.
5. Training the personnel involved in providing nutrition education.

#### **Nutritional services provided at school**

Out of the sixteen schools surveyed, only six had "canteens" selling food to children. Few items were available: sweets, chocolates, biscuits and potato chips. In three instances only, the canteen provided taameia (bean cakes) sandwiches and pop corn in addition to the above mentioned regular items. The six canteens were rated by data collectors as adequately ventilated and illuminated. With one exception, no insects could be seen (at the time of interview). However four out of the six canteens were rated as unclean.

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\* Information in this section is not presented in a tabular form, since the study was carried out on 16 schools and 8 primary care units, to draw a profile of existing nutritional services, rather than creating cross-tabulations.

Interviewed personnel in charge of canteens believed that pupils prefer to purchase food from school canteens rather than street vendors. The advantages mentioned were:

1. Ready availability (no other provider within the school premises).
2. Tolerable prices.
3. Clean and packaged food.
4. Offering a variety of products.

None of the surveyed schools provided school meals to students. Only two schools had displayed educational posters related to nutrition (showing the components of an adequate meal). One of those two schools had educational booklets on nutrition- related topics.

None of the schools had a nutritional education program, but three schools held occasionally sessions providing nutritional knowledge within a broader frame of health education activities.

## Appendix

### Quality Control Data

There was a fairly high level of concordance between quality control results and original survey results. The overall non-concordance (disagreement) was 9% for form A (medical history, medical examination, anthropometry and laboratory findings of primary and preparatory students) \*<sup>2</sup>, 18% for form B (knowledge, beliefs and practices of primary and preparatory students), 15% for form C (knowledge, beliefs and practices of health care providers) and 12% for form D (knowledge, beliefs and practices of community members). This percentage of disagreement, although within the acceptable range may be due to several factors:

- a. The interviewed person may have changed his/her mind between the original interview and the quality control interview, this could be more frequent with children (therefore the B form has the highest non concordance of 18%).
- b. The interviewed person may have been sensitized by the interview and tried to seek information in between the interviews.
- c. Many questions refer to giving examples for food sources for certain items or certain malnutrition deficiencies. The interviewed person may prefer to give other examples in the second interview, especially so if he discussed the issue with others in between the two interviews.
- d. Certain clinical findings may change between the two examinations (chest findings, functional non-organic hemic murmurs, or pediculosis). Taking into consideration the above mentioned sources of response variation, the overall concordances between the original survey findings and those of the quality control falls within the acceptable realm.

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\* For quantitative data (such as height and weight), correlation coefficients (  $r$  ) were calculated between original survey data and quality control data. For heights and weights the correlation was very high ( $r= 0.973$  for height and  $r = 0.967$  for weight).