



## Studies on The Nutritional Status of Some Students of Al-Azhar Institutes

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### Abstract

This study examined the nutritional health of Al-Azhar Institutes students in Al-Qalyubia Governorate. It took 2021–2023 to complete the study. Students between 7 and 12 are particularly affected by hunger and malnutrition, which stunts their growth and health. The sample included 362 pupils from Moshtohor hamlet and Qaha city, 188 men and 174 girls. The survey of 362 pupils statistically collected data on home eating, food type and food skills. Student life is social, economic and daily. A 24-hour food recall model across three days found protein, mineral, vitamin and calorie intake below WHO RDAs. The study employed BMI and found 250 normal, 63 underweight, 40 overweight, 9 obese and 20 stunted in urban areas and 28 in the countryside. Anemia and hemoglobin % were monitored by the Ministry of Health (100 Million Health Campaign) to curb obesity. Eighty-five urban students and 21 rural students had anemia. This study also found that some students had a poor diet, such as not drinking enough water, eating fast food, eating sweets and drinking tea and coffee between meals, which caused neglect of the main meal and lack of dietary diversity in the primary stage.

**Keywords:** Urban, Rural, Malnutrition, Anemia, Obese, Stunting, Nutritional evaluation

### Introduction

Food nutrition should support school-age children's development and academic success. Nutritional deficiencies from eating bad food at this age could affect their development and growth. These poor foods may impair children's weight regulation, leading to an adult weight increase. To ensure kids get the nutrients they need for optimal health, it's important to pay close attention to each meal's nutritional value (Guthrie and Buzby, 2002). The school lunch is essential for all kids. Children can use this to meet some of their nutritional needs and have a healthy dinner that will help them learn. Due to rising obesity rates, students need to learn appropriate eating habits in school to make smart choices at home and in their communities (Guthrie and Buzby, 2002).

Kwak *et al.* (2016) state that school food service provides nutritionally balanced meals to pupils to support healthy physical and mental development and lifelong good eating habits. Like other institutional food services, school food services process environmental inputs to achieve their goals. (Kwak *et al.*, 2014). Effective nutrition education changes student attitudes and promotes healthy eating (Guthrie and Buzby, 2002; Kim *et al.*, 2000 and Hayes *et al.*, 2018). Nutrition education combined with food service activities, including high-quality meals, healthy food selections and

sampling events, may have lasting effects (Guthrie and Buzby, 2002 and Hayes *et al.*, 2018). Students that are satisfied with school food eat more (Kim *et al.*, 2000 and Hong and Chang, 2003).

School is a nutritionally significant time since it is the optimum time to store nutrients for quick growth in adolescence. A low-protein, low-calorie diet in kids causes stunted growth, poor cognitive development, learning difficulties, underweight, wasting and lower infection susceptibility (Gowri and Sangunam, 2005). Assessment of anemic school children's cognitive and motor skills. Child undernutrition, which can take numerous forms, is usually measured by weight and height. A youngster can be stunted, wasted, or underweight. Underweight children might be stunted or wasted (Ghai *et al.*, 2006).

It is believed that many children in affluent countries have poor health and lunch, which negatively impacts their learning approach since they need particular care in the early stages of education. No health issues or inability to do tasks developed before 18, 17% and other exams. 3-4 million Americans have physical disabilities (Glewwe and Miguel, 2007). Food is essential to nations and peoples since it reflects human progress and early nutrition interests. He can grow and develop according to his genetics because age minimizes his risk of malnutrition (Ludwig *et al.*, 2001).

Increasing the prevalence of pediatric overweight and obesity during the previous decades has been a serious issue both in developed and developing nations (Motlagh *et al.*, 2011). A systematic investigation found that the global prevalence of overweight and obesity in children and adults had increased considerably in developing countries, including Iran, from 1980 to 2013 (Ng *et al.*, 2014). Many factors affect diet, including nutritional understanding (Vereecken *et al.*, 2012). Schools are good sites for dietary and behavioral interventions because kids spend most of their time there (Khambalia *et al.*, 2012). Nutrition education initiatives in other nations have improved children's nutrition knowledge and diets (Powers *et al.*, 2005). In South Africa, 28.1% of the population is under 15 (Krueger *et al.*, 2015). School children's physical, mental, social and economic development benefits from good nutrition (Dewey and Begum, 2011). Malnutrition poses the greatest worldwide health risk (Kumar *et al.*, 2017). Nutrition is the main factor affecting the quality of life in children. When a person's diet lacks nutrients, they become malnourished. WHO estimated that 27% of under-5s in poor nations are underweight. According to the 2011 National Nutrition Survey, 31% of under-5s are underweight. Nutrition is essential to elementary school children's physical and mental development (Yankanchi *et al.*, 2018 and Kumar *et al.*, 2019). Different methods are used to measure childhood overweight and obesity. However, polls using diverse measurement methods show one way. In most countries, the number of children and adolescents afflicted is rising rapidly (Lobstein *et al.*, 2015).

## Materials and methods

### Materials:

Three hundred sixty-two 7-12-year-old boys and girls were randomly selected for the study. The study goals were explained to the selected School's administrative staff. Every parent received a letter detailing the procedure and requesting permission to evaluate the youngster.

A representative sample of students enrolled in Al-Azhar Institutes at the primary level at Al-Qalyubia Governorate, Egypt, was used in this study. This sample amounted to 362, including 188 (51.9%) male students and 174 (48.1%) female students.

### 1.1. Tools of the Study:

The study was carried out by selecting two institutes, one in the sample of 217 male and female students in the rural Moshtohor village and the other sample of 145 male and female students in the urban of Qaha city. These two samples were aged 7-12 years in the primary stage.

A pre-prepared questionnaire form was designed to evaluate the nutritional status of students.

## 1.2. Social-economic survey included the following aspects:

### 1.2.1. Data related to the sample itself:

It includes collecting data on age, gender, degree of educational attainment, family characteristics, the child's lifestyle and studying eating habits, such as inquiring about eating food, whether at home, institute, or outside the home, the number of meals, the time to eat breakfast, the time to leave the home, the beginning and end of the school day and recess. The school day, eating or not eating the school meal, eating fruits, vegetables, dairy products, eggs or drinking milk, tea or coffee, prepared foods, sandwiches or pies.

### 1.2.2. Social case of the parents:

The study of social customs includes data about the family, such as the number of family members, knowledge of the head of the family, the educational status and the qualifications and occupation of the father and mother.

### 1.2.3. Income of family feature:

The study of economic habits includes the father's income, security, whether the income is high, medium, or low and total income and its sources or not. Students and parents collected this data.

### 1.2.4. Anthropometric measurements:

Through the obesity, anemia and dwarfism campaign carried out by the Ministry of Health every year at the Al-Azhar institutes, through a medical team and the health visitors at the institutes.

### 1.2.5. Length:

Physical (anthropometric) measurements were taken, which include height using a tape measure without shoes.

### 1.2.6. Body Weight:

Weights were taken without shoes and with the wearer's undergarments removed, with a range of 1-150 kg, with the accuracy level set to the nearest 1.0 kg. During the second quarter of 2021, the scale was set to zero to ensure balance.

Using the (Anthro-Plus) program at the National Institute of Nutrition to obtain the body mass index. This program enters weight, height and age and through the growth curve based on (Z-score) for males and females of the three different nutritional indicators in comparison to the newly published World Health Organization/National Center for Health Statistics (WHO/NCHS) reference population using the WHO Anthro Plus Software (Blössner *et al.*, 2010). Using the Ecotest device to detect anemia by measuring the level of hemoglobin in the blood.

### 1.2.7. Dietary intake:

A food retrieval form was created 24-recall hours a day over 3 consecutive days and students and parents filled out the form.

## 2. Method:

The 24-hour dietary recalls were gathered utilizing the 5-step procedure designed by the United

States Department of Agriculture (USDA), known as the Multiple Pass Food Recall (MPR) method (Moshfegh *et al.*, 2008). For every individual, we obtained two 24-hour recollections. A profile of food consumption was obtained by tracking eating frequency. A survey was created to inquire about the chosen foods on a daily, weekly and monthly basis.

Participants' anthropometric data, including age, gender, portion, time and meal details, were entered using ESHA Research Food Processor SQL and ESHA Port SQL software version 10.3. For handmade meals, we gathered recipes and how-to instructions and we evaluated how much each subject ate. An examination of nutrients was conducted.

**3. Statistical analysis:**

The statistical analysis was carried out using two way-ANOVA and Chi-square using SPSS, ver.

27 (IBM Corp. Released 2013). Data were treated as a complete randomization design according to Steel *et al.* (1997). The significance level was set at < 0.05.

**Results and discussion**

The study was conducted on Al-Azhar primary school students for a sample represented in the Qalyubia Governorate, Egypt, in urban area (Qaha) and rural area (Moshtohr). The sample size was 362 male and female students aged 7-12 years.

**1. Socio-demographic characteristics of Al-Azhar primary institute students:**

Data in Table (1) showed the statistical analysis of the average weight of 27.46 ±7.29 kg and the average height of 128.06±9.51 cm of Al-Azhar primary institute students.

**Table 1.** Socio-demographic characteristics of Al-Azhar primary institute students.

Sample volume characteristics		362				
Age (year)		7-12				
Weight (kg)		27.46±7.29				
Height (cm)		128.06±9.51				
Gender	Boys		Girls		Total	
	No.	%	No.	%	No.	%
	188	51.90	174	48.07	362	100

**2. Body mass index for both male and female students and anthropometric measurements for children:**

Data in Table (2) showed that the BMI for normal males was (32.60%), which is lower than that for normal females (36.46%). Underweight males were (11.05%), which was greater than that for underweight females (6.35%). The overweight of females was (5.25%), which was less than that of males (5.80%) and the obese males were only (2.49%). At the same time, the anthropometric measurements of normal students in urban areas were (25.14%) lower than those of normal students in rural

(43.92%). The underweight of students in the rural area was (8.56%) less than that of urban areas (8.84%), while the overweight students in the urban area (5.25%) were less than that of rural ones (5.80%). The number of obese students in rural areas was (1.66%) greater than in urban areas (0.83%). Data in the same table indicate the body mass index of the total sample, including 69.1% normal, 17.4% underweight, 11.1% overweight and 2.4% obese, according to UNICEF (2015). There is a non-significant difference (P>0.05) between groups of students according to their weight in rural and urban areas.

**Table 2.** Body mass index for both male and female of Al-Azhar primary institute students.

Parameter		Number of students	Body mass index				Total
			Normal	Underweight	Overweight	Obesity	
Sex	Male	No. 118 (%) 32.60 <sup>aA</sup>	40 11.05 <sup>aB</sup>	21 5.80 <sup>aBC</sup>	9 2.49 <sup>aC</sup>	188 51.93 <sup>a</sup>	
	Female	No. 132 (%) 36.46 <sup>aA</sup>	23 6.35 <sup>aB</sup>	19 5.25 <sup>aB</sup>	0 0.00 <sup>aB</sup>	174 48.07 <sup>a</sup>	
	Total	No. 250 (%) 69.06 <sup>A</sup>	63 17.4 <sup>B</sup>	40 11.05 <sup>B</sup>	9 2.4 <sup>B</sup>	362 100.00	
Anthropometric	Urban	No. 91 (%) 25.14 <sup>bA</sup>	32 8.84 <sup>aAB</sup>	19 5.25 <sup>aAB</sup>	3 0.83 <sup>aB</sup>	145 10.02 <sup>a</sup>	
	Rural	No. 159 (%) 43.92 <sup>aA</sup>	31 8.56 <sup>aB</sup>	21 5.80 <sup>aB</sup>	6 1.66 <sup>aB</sup>	217 14.99 <sup>a</sup>	
	Total	No. 250 (%) 69.1 <sup>A</sup>	63 17.4 <sup>B</sup>	40 11.1 <sup>B</sup>	9 2.4 <sup>B</sup>	362 100.00	

a, b, & c: There is no significant difference (P>0.05) between any two means within the same column that have the same superscript letter.

A, B & C: There is no significant difference ( $P>0.05$ ) between any two means within the same row that have the same superscript letter

### 3. Age and body length of students in urban and rural areas:

Data in **Table (3)** showed that the students 7 years of age in urban areas (39.31%) were older than those in rural areas (23.96%), while those 8 years in rural areas were as a ratio of (25.35%), while in urban area there was zero and 9 years in rural area was (4.15%) greater than urban (2.76%) and 10 years urban (23.45%) less than rural (18.43%) and at age 11 rural (16.59%) older than urban (16.55%) and in age 12 years in urban area (17.93%) older than in rural area (11.52%). The students with normal body

length in rural areas were as a ratio of (87.10%) older than those in urban areas (86.21%) and short students in rural areas were a ratio of (12.90%) greater than urban (13.79%). There were very significant differences between rural and urban areas in different groups of students according to length between normal and short from 7-12 years of institute students. Similar to length in rural and urban areas, these differences may be due to height or total body length being influenced by heredity apart from nutritional and other environmental factors (**Nanda, 2000**).

**Table 3.** Age and Body length of students in areas urban and rural.

Questions	Answers	Society type				Chi-square	P-value
		Urban		Rural			
		No.	%	No.	%		
Age	7 years	57	39.31	52	23.96	55.53	0.000
	8 years	0	0.00	55	25.35		
	9 years	4	2.76	9	4.15		
	10 years	34	23.45	40	18.43		
	11 years	24	16.55	36	16.59		
	12 years	26	17.93	25	11.52		
Total body length	Normal	125	86.21	189	87.10	106.60	0.000
	Short	20	13.79	28	12.90		

### 4. Breakfast consumption between institute students:

Data in **Table (4)** showed that in the rural area, (27.19%) of students eat breakfast at home, (40.55%) do not eat breakfast, (53.50 %) do not eat due to loss of appetite, (15.92%) for lack of time, (30.57%) because there is no eat breakfast at home and (0.0%) for other reasons. Children eat breakfast sometimes at (32.26%). While in urban areas, it is (71.72%) of children ate breakfast at home, (28.28%) did not eat breakfast, (92.86 %) due to loss of appetite (7.14%) to lack of time and (0.0%) for other reasons. In urban area, breakfast was at 6 o'clock (16.67%), 7 o'clock (50.00%), 8 o'clock (4.17%), 9 o'clock (3.47%), 10 o'clock (15.97%), 11 o'clock (2.78%), 12 o'clock (4.86%) and 1 o'clock (2.08%). While in the rural area, breakfast was at 6 o'clock (2.33%), at 7 o'clock (7.91%), at 8 (4.65%), at 9 (8.37%), at 10 (22.79%), at 11 (32.09%), at 12 (19.53%) and 1 (2.33%). In the rural, (62.79%) of children ate snack foods and (37.21%) did not. Students obtained food from home (48.85%) and from school (21.66%) and students purchased food from the institute (28.57%) and obtained food from other sources (0.92%). While in urban areas, (78.47%) ate snack foods and (21.53%) did not. Students obtained food from home (73.10%) and from the institute (11.72%), purchased food from the

institute (15.17%) and obtained food from (0.00%). In rural areas, (12.44%) of students ate sweets, at sandwiches (48.39%), institute meals and (24.42%) of other types of foods and others (14.75%). While, in urban areas, they consumed sweets (2.07%), sandwiches (68.97%), institute meals (28.97%) and other types of foods (0.0%). In the rural area, (94.47%) of students ate lunch, but (5.53%) did not. In urban areas, (88.28%) of children ate lunch, but (11.72%) did not. In the rural area, the number of consumed meals institute by students per week: one meal (8.29 %), two meals (13.36%), three meals (27.19%), four meals (27.65%), five meals (8.29%), six meals (1.84%) and seven meals (13.36%), while in urban areas, one meal (1.41%), two meals (5.63%) three meals: (7.04%), four meals (4.23%), five meals (4.23%), six meals (0.0%) and seven meals: (77.46%). Of students who ate lunch at a specific time in the rural area, (25.81%) and (74.19%) did not eat, while in urban area (43.75%) ate lunch at a specific time and (56.25%) did not eat. This study is consistent with the study of similar for **Satcher and Bisceglie, (2013)**. There were very high significant differences between urban and rural areas in students who ate breakfast at home, the type of meals, timing and number of lunch times eaten per week when taken at a specific time when p-value ( $p=0.000$ ).

**Table 4.** Breakfast consumption between institute students.

Question	Number of students	Answer	Society type				Chi-square	p-value
			Urban		Rural			
			No.	%	No.	%		
<b>Do you eat breakfast at home</b>	<b>(362)</b>	<b>Yes</b>	<b>104</b>	<b>71.72</b>	<b>59</b>	<b>27.19</b>	<b>35.05</b>	0.000
		<b>No</b>	<b>41</b>	<b>28.28</b>	<b>88</b>	<b>40.55</b>		
		<b>Occasionally</b>	<b>0</b>	<b>0.00</b>	<b>70</b>	<b>32.26</b>		
<b>If the answer is no or sometimes (why)</b>	<b>(201)</b>	<b>No appetite</b>	<b>39</b>	<b>92.86</b>	<b>84</b>	<b>53.50</b>	<b>118.18</b>	0.000
		<b>There is no time</b>	<b>3</b>	<b>7.14</b>	<b>25</b>	<b>15.92</b>		
		<b>There is no breakfast at home</b>	<b>0</b>	<b>0.00</b>	<b>48</b>	<b>30.57</b>		
		<b>Other reasons</b>	<b>0</b>	<b>0.00</b>	<b>0</b>	<b>0.00</b>		
What time do you eat breakfast?	<b>(359)</b>	<b>6 o'clock</b>	<b>24</b>	<b>16.67</b>	<b>5</b>	<b>2.33</b>	<b>192.25</b>	0.000
		<b>7 o'clock</b>	<b>72</b>	<b>50.00</b>	<b>17</b>	<b>7.91</b>		
		<b>8 o'clock</b>	<b>6</b>	<b>4.17</b>	<b>10</b>	<b>4.65</b>		
		<b>9 o'clock</b>	<b>5</b>	<b>3.47</b>	<b>18</b>	<b>8.37</b>		
		<b>10 o'clock</b>	<b>23</b>	<b>15.97</b>	<b>49</b>	<b>22.79</b>		
		<b>11 o'clock</b>	<b>4</b>	<b>2.78</b>	<b>69</b>	<b>32.09</b>		
		<b>12 o'clock</b>	<b>7</b>	<b>4.86</b>	<b>42</b>	<b>19.53</b>		
		<b>1 o'clock</b>	<b>3</b>	<b>2.08</b>	<b>5</b>	<b>2.33</b>		
<b>Do you eat any food during the break?</b>	<b>(359)</b>	<b>Yes</b>	<b>113</b>	<b>78.47</b>	<b>135</b>	<b>62.79</b>	<b>38.12</b>	0.000
What is the source of the meal of the break?	<b>(253)</b>	<b>Bring it from home</b>	<b>106</b>	<b>73.10</b>	<b>106</b>	<b>48.85</b>	<b>127.23</b>	0.000
		<b>Could you buy it from school?</b>	<b>2</b>	<b>11.72</b>	<b>31</b>	<b>21.66</b>		
		<b>School Meal</b>	<b>6</b>	<b>15.17</b>	<b>0</b>	<b>28.57</b>		
		<b>Another source</b>	<b>0</b>	<b>0.00</b>	<b>2</b>	<b>0.92</b>		
Quality of the glade meal?	<b>(256)</b>	<b>Dessert</b>	<b>3</b>	<b>2.07</b>	<b>27</b>	<b>12.44</b>	<b>112.48</b>	0.000
		<b>Sandwiches</b>	<b>100</b>	<b>68.97</b>	<b>105</b>	<b>48.39</b>		
		<b>School Meal</b>	<b>42</b>	<b>28.97</b>	<b>53</b>	<b>24.42</b>		
		<b>Other</b>	<b>0</b>	<b>0.00</b>	<b>32</b>	<b>14.75</b>		
Do you eat lunch at home?	<b>(359)</b>	<b>Yes</b>	<b>128</b>	<b>88.28</b>	<b>205</b>	<b>94.47</b>	<b>135.20</b>	0.000
How many lunches (per week)?	<b>(337)</b>	<b>No</b>	<b>16</b>	<b>11.72</b>	<b>10</b>	<b>5.53</b>	<b>232.71</b>	0.000
		<b>Once</b>	<b>2</b>	<b>1.41</b>	<b>4</b>	<b>8.29</b>		
		<b>Twice</b>	<b>2</b>	<b>5.63</b>	<b>29</b>	<b>13.36</b>		
		<b>Three times</b>	<b>4</b>	<b>7.04</b>	<b>59</b>	<b>27.19</b>		
		<b>Four times</b>	<b>6</b>	<b>4.23</b>	<b>60</b>	<b>27.65</b>		
		<b>Five Times</b>	<b>5</b>	<b>4.23</b>	<b>18</b>	<b>8.29</b>		
		<b>Six times</b>	<b>0</b>	<b>0.00</b>	<b>4</b>	<b>1.84</b>		
		<b>Seven times</b>	<b>111</b>	<b>77.46</b>	<b>29</b>	<b>13.36</b>		
Do you eat lunch at a specific time?	<b>(361)</b>	<b>Yes</b>	<b>63</b>	<b>43.75</b>	<b>56</b>	<b>25.81</b>	<b>24.48</b>	0.000
		<b>No</b>	<b>81</b>	<b>56.25</b>	<b>161</b>	<b>74.19</b>		

### 5. Dinner consumption by institute students:

Data in **Table (5)** showed that students who consumed dinner in rural areas were (58.99%) and (41.01%) did not eat; the students who ate meals regularly (17.51%) and (82.49%) did not eat; those who ate foods between meals were (72.35%) and (27.65 %) did not eat. The students who ate foods were (12.44 %) and drinks (17.51%), fruits (10.14%), sweets (12.44%) and toasted pastries (41.01%), others (6.45%). On the other hand, the number of meals eaten daily was one meal (0.92%), two meals (19.82%), three meals (36.87%), four meals (41.94%) and more than that (0.46%). While in an urban area, the students who usually ate dinner were (88.28%) and did not eat (11.72%); the

students who ate meals regularly were (71.03%) and (28.97%) did not eat; those who ate foods between meals were ( 60.69 %) and (39.31%) did not eat. The students who ate foods were (7.59 %) and drinks (18.62%), fruits (4.14%), sweets (0.69%) and toasted pastries (62.07%), others (6.90%). Furthermore, the number of meals eaten daily was one meal and (1.38%), two meals (24.83%), three meals (70.34%), four meals (3.45%) more than that (0.0%), according to **Persson (2012)**. There are very high significant differences when p value 0.000 (p= 0.000) between urban and rural areas in eating dinner and meals regularly, the types of foods between meals and the number of meals eaten daily.

**Table 5.** Dinner consumption of institute students.

Question	Number of students	Answer	Society type				Chi-square	p-value
			Urban		Rural			
			No.	%	No.	%		
Do you eat dinner (usually)	(362)	Yes	128	88.28	128	58.99	61.00	0.000
		No	17	11.72	89	41.01		
Do you eat meals regularly?	(362)	Yes	103	71.03	38	17.51	58.60	0.000
		No	42	28.97	179	82.49		
Do you eat food between meals?	(362)	Yes	88	60.69	157	72.35	24.20	0.000
		No	57	39.31	60	27.65		
What is the quality of these foods?	(362)	Foods	11	7.59	27	12.44	187.88	0.000
		Drinks	27	18.62	38	17.51		
		Toasted amusements	90	62.07	89	41.01		
		Candies	1	0.69	27	12.44		
		Fruits	6	4.14	22	10.14		
		Other	10	6.90	14	6.45		
How many meals do you eat daily?	(362)	One meal	2	1.38	2	0.92	165.58	0.000
		Two meal	36	24.83	43	19.82		
		Three meal	102	70.34	80	36.87		
		Four meal	5	3.45	91	41.94		
		Furthermore	0	0.00	1	0.46		

### 6. School meals:

Data in **Table (6)** showed that in the rural area, the time for receiving the institute meal was in the morning (4.15%), at recess time (95.85%), before going to bed (0.0%), without a time, (0.0%) and those who ate the meal, (51.15%) and did not eat it (48.85%). The reason for this was that some students did not like its taste (34.62%), some of them thought that the time spent receiving meals was inappropriate (11.54%) and others gave them to their siblings (53.85%). Furthermore, the students who regularly eat institute meals (26.39%) and those who are not regularly (73.61%) and eat these meals in the morning (0.0%), as a ratio (31.34%) and at home (58.53%) and without an appointment (10.14%) according to **Fletcher and Frisvold, (2017)**. The students who rarely eat fruits once a week (4.15%) and sometimes twice (40.09 %) and often more than

three times (55.76%) and those who rarely eat vegetables once a week (32.26%) and sometimes twice (58.53%) and often more than 3 times (9.22%). While in urban areas, the time for receiving the meal was in the morning (28.28%) at recess time (9.66%) before going to bed (1.38%) without an appointment (60.69%) and those who ate the school meal, (80.69%) and did not eat it (19.31%). This is because some children do not like its taste (41.38%) and the time for receiving meals was inappropriate (3.45%) some of them gave it to their sisters at home (55.17%) and children who ate regular meals (80.56%) and irregular ones (19.44%). They ate these meals in the morning (0.70%), at recess (21.13%), at home (53.52%) and without appointments (24.65%). The students ate fruits rarely, once a week (2.76%), sometimes. Twice (35.86%) and often more than three times (61.38%)

and they eat vegetables weekly rarely (18.75%). Sometimes twice (50.00%) and often more than three times (31.25%) according to the findings of this study, showed that the contribution of vegetables and fruit food groups fell far below the recommendation of food-based dietary guidelines **WFP (2010)**. However the findings are similar to a study done in the Eastern Mediterranean Region (**WHO 2010**), which reported a relatively low consumption of vegetables and fruits in most of the developing countries and also another one done in Kenya (**MoH**)

(**UNICEF (2001)**). There were very high significant between urban and rural areas when value ( $p = 0.000$ ) in eating and not eating the school meal, in the case of eating the school meal, whether its taste is not sweet, the time is not appropriate, or he gives it to his brothers at home in receiving the school meal, eating it in the morning, at recess time, before going to school and without a scheduled time, eating and not eating meals regularly, eating vegetables and fruits once, twice, or three times a week.

**Table 6.** School meals.

Questions	Number of students	Answers	Society type				Chi-square	p-value
			Urban		Rural			
			No.	%	No.	%		
When do you receive school meals?	(362)	<b>Morning</b>	41	28.28	9	4.15	215.14	0.000
		<b>Break time</b>	14	9.66	208	95.85		
		<b>Before leaving</b>	2	1.38	0	0.00		
		<b>There is no appointment</b>	88	60.69	0	0.00		
Do you eat school meals?	(362)	<b>Yes</b>	117	80.69	111	51.15	38.48	0.000
		<b>No</b>	28	19.31	106	48.85		
If the answer is no - state the reason.	(133)	<b>He doesn't like the taste of it</b>	12	41.38	36	34.62	70.00	0.000
		<b>The timing of its distribution is not appropriate</b>	1	3.45	12	11.54		
		<b>He gives it to his brothers at home</b>	16	55.17	56	53.85		
		<b>Yes</b>	116	80.56	57	26.39		
Do you eat meals regularly?	(360)	<b>No</b>	28	19.44	159	73.61	61.48	0.000
When do you eat it?	(359)	<b>Morning</b>	1	0.70	0	0.00	95.89	0.000
		<b>Break time</b>	30	21.13	68	31.34		
		<b>Return home</b>	76	53.52	127	58.53		
		<b>There is no appointment</b>	35	24.65	22	10.14		
Do you usually eat fruits?	(362)	<b>Rarely once a week</b>	4	2.76	9	4.15	93.34	0.000
		<b>Sometimes twice</b>	52	35.86	87	40.09		
		<b>Often more 3 times</b>	89	61.38	121	55.76		
Do you usually eat vegetables?	(361)	<b>Rarely once a week</b>	27	18.75	70	32.26	52.24	0.000
		<b>Sometimes twice</b>	72	50.00	127	58.53		
		<b>Often more 3 times</b>	45	31.25	20	9.22		

### 7. Drinks and food products for students' consumption:

Data in **Table (7)** showed that in the rural areas, the students who drink milk and eat dairy products rarely, once a week (64.98%), sometimes twice (28.11%) and often more than three times (6.91%), according to the findings of this study showed that the contribution of the milk/milk products groups fell far below the recommendation of food-based dietary guidelines **WFP (2010)**. The students who eat eggs rarely, once a week (45.16%), sometimes twice (46.08%) and often more than three times (8.76%) times and they drink tea and coffee (87.91%), but (12.09%) do not drink them. On the other hand, students who ate ready (43.06%) and did not eat (56.94%). They eat fava beans and Falafel (50.46%), Koshari (26.39%), liver sandwiches, hamburgers, sausage (0.0%) and bakery products such as pizza and pies (23.15%). The obtained results showed that the time for students to leave the house in the morning 7 was (48.39%), 7:30 (51.61%), 8 (0.0%), 10:30 (29.77%) and 10.45 (70.23%). Furthermore, students practiced sports activities

during rest time, (78.24%) and (21.76%) did not practice. In the urban area, students drank milk rarely, once a week (39.31%), sometimes twice (22.07%) and often more than three times (38.62%). Also, students who ate eggs rarely, once a week (37.93%), sometimes twice (27.59%) and often more than three times (34.48%). Students who drank tea and coffee (62.76%) and did not drink (37.24%). The students bought ready-made foods (20%) and (80%) did not eat them. Those who ate fava beans and taameya (4.14%), Koshari (16.55%), liver sandwiches, hamburgers and sausages (79.31%) and bakery products (0.0%). The time for the children to leave the house in the morning was 7 (32.41%) and the time at 7:30 was (65.52%), 8 was (2.07%) time was 10:30 (55.17%) and 10.45 pm (44.83%). The students practice sports activity during recess (70.34%) and (29.66%) do not practice it (**Satcher and Bisceglie, 2013**). There is a very high significant difference between the urban and rural areas in drinking milk or eating dairy products, eating ready-made foods and exercising when p-value (p= 0.000).

**Table 7.** Drinks milk and dairy products for students consumption.

Questions	Number of students	Answers	Society type				Chi-square	p-value
			Urban		Rural			
			No.	%	No.	%		
Do you drink milk or eat dairy products?	(362)	Rarely once a week	57	39.31	141	64.98	57.52	0.000
		Sometimes twice	32	22.07	61	28.11		
		Often more 3 times	56	38.62	15	6.91		
Do you eat eggs?	(362)	Rarely once a week	55	37.93	98	45.16	28.18	0.000
		Sometimes twice	40	27.59	100	46.08		
		Often more 3 times	50	34.48	19	8.76		
Do you drink tea or coffee?	(360)	Yes	91	62.76	189	87.91	64.52	0.000
		No	54	37.24	26	12.09		
Do you buy ready-made foods (sandwiches or pies)?	(361)	Yes	29	20.00	93	43.06	37.96	0.000
		No	116	80.00	123	56.94		
What is the quality of this food?	(361)	Sandwiches (beans, falafel, eggplant)	6	4.14	109	50.46	110.08	0.000
		Koushari	24	16.55	57	26.39		
		Sandwiches (liver - hamburger - sausage)	115	79.31	0	0.00		
		Bakery (fetter - pate - pizza)	0	0.00	50	23.15		
What time do you leave the house in the morning?	(362)	7 o'clock	47	32.41	105	48.39	59.80	0.000
		7:30 o'clock	95	65.52	112	51.61		
		8 o'clock	3	2.07	0	0.00		
What is the break time?	(360)	10:30 o'clock	80	55.17	64	29.77	17.00	0.001
		10:45 o'clock	65	44.83	151	70.23		
Do you engage in any sporting activity during the break?	(361)	Yes	102	70.34	169	78.24	47.36	0.000
		No	43	29.66	47	21.76		

**8. Educational and employment status of the father and mother of students:**

Data in **Table (8)** indicated that the number of family members in the rural area was 6, higher (37.33%), while in urban area the number was 5, higher (45.52%). The head of the family was the father in the rural and urban areas (100%). In the urban situation, the father's education status was higher education (49.66%). The lowest percentage was illiterate (0.69%). In comparison, in the rural area the father's educational status was intermediate and above-intermediate education, representing the highest percentage (40.55%) and the lowest percentage was post-university education (0.0%). In comparison, the mother's education was less than average, representing the highest percentage of education (30.41%) and the lowest percentage of post-university education (0.0%). The father's highest occupation was an urban employee (57.24%), while the mother's highest job was self-employment (66.90%). The lowest job for the father and mother was on a pension (0.0%). On the other hand, in the rural, the highest job for the father was self-

employment (52.07%) and the highest job for the mother was self-employment (72.35%). The lowest percentage of education for the father and mother was on pension (0.0%), similar to (**Abdelaziz et al., 2015 and Elseifi et al., 2020**). These studies were based on a study of the nutritional status, eating habits of children and malnutrition among children aged (5-19 years) in Beni-Suef Governorate, Egypt, studying the educational and employment status of the father and mother in terms of reading and writing, as well as family size. This study was based on evaluating the effect of nutritional education based on Pender's health promotion model on breakfast consumption behavior among Egyptian institute students. There are very high significant differences between urban and rural areas when p-value 0.000 (p= 0.000) in the number of family members, whether 3, 4, 5, 6, 7, 8, or 9, the education of the father, whether he is illiterate, reads, writes, below average, average, or above average, highly qualified, or above high and the occupation of the father and mother, whether they are workers, employees, self-employed, or on a pension.

**Table (8): Educational and employment status of the father and mother of students.**

Questions	Number of students	Answers	Society type				Chi-square	P-value
			Urban		Rural			
			No.	%	No.	%		
How many family members?	(362)	Three people	1	0.69	2	0.92	174.41	0.000
		Four people	33	22.76	22	10.14		
		Five people	66	45.52	49	22.58		
		Six people	37	25.52	81	37.33		
		Seven people	7	4.83	49	22.58		
		Eight people	0	0.00	10	4.61		
		Nine people	1	0.69	4	1.84		
Who is the head of the family?	(362)	Father	145	100.00	217	100.00	--	--
		Mother	0	0.00	0	0.00		
		Big brother	0	0.00	0	0.00		
		Other	0	0.00	0	0.00		
Father's educational status	(362)	Don't read or write	1	0.69	6	2.76	172.84	0.000
		Reads and writes	5	3.45	12	5.53		
		Have a below-average qualification	10	6.90	53	24.42		
		Have an intermediate or above-intermediate qualification	51	35.17	88	40.55		
		Holds a university qualification	72	49.66	58	26.73		
		Have a post-university qualification	6	4.14	0	0.00		
Mother's educational status	(362)	Don't read or write	3	2.07	21	9.68	99.90	0.000
		Reads and writes	7	4.83	53	24.42		
		Have a below-	12	8.28	66	30.41		

		average qualification						
Father's job	(362)	Have an intermediate or above-intermediate qualification	69	47.59	43	19.82		
		Holds a university qualification	54	37.24	34	15.67		
		Have a post-university qualification	0	0.00	0	0.00		
		Worker	2	1.38	16	7.37	83.36	0.000
		Employee	83	57.24	88	40.55		
Mother's job	(362)	Free Business	60	41.38	113	52.07		
		With pension	0	0.00	0	0.00		
		Worker	6	4.14	18	8.29	131.30	0.000
		Employee	42	28.97	42	19.35		
		Free Business	97	66.90	157	72.35		
		With pension	0	0.00	0	0.00		

### 9. Economic status of the father and mother of students:

Data in **Table (9)** indicated that in urban areas, it was the highest income percentage for the family was low at 69 (47.59%), medium at 56 (38.62%) and high at 20 (13.79%). On the other hand, in rural areas, it was the highest income percentage for the family was low at 109 (50.23%). The medium was 73 (33.64%) and the high was 35 (16.13%), according to **Mukudi (2003) and UNICEF (2007)**. Mukudi study showed that

nutritional status and low socioeconomic status have an impact on academic achievement, while the UNICEF study showed that 11 percent of the global burden of disease. It is more prevalent in low and lower-middle-income countries. There was a very high significant difference (P-value= 0.000) between rural and urban areas. In contrast, low income represented the highest percentage and high income was the lowest percentage of income in urban and rural areas.

**Table (9): Economic status of the father and mother of students.**

Family income	Society type				Chi-square	Sig.
	Urban		Rural			
	No.	%	No.	%		
Low (<3000 LE)	69	47.59	109	50.23	35.81	0.000
Medium (3000-5000)	56	38.62	73	33.64		
High (>5000)	20	13.79	35	16.13		

### 10. Students anemia disease in urban and rural areas:

Data in **Table (10)** showed that the percentage of students affected by anemia in rural areas was 3.87% in males and 1.93% in females and

in urban areas, it was 11.33% in males and 12.15% in females. The total number of those infected with anemia was 29.28% and those who were non-infected were 70.72%, according to **(WHO, 2010)**.

**Table 10.** Students' anemia disease in urban and rural areas.

State	Society type								Total	
	Urban				Rural					
	Male		Female		Male		Female			
	N	%	N	%	N	%	N	%	N	%
Anemic	41	11.33	44	12.15	14	3.87	7	1.93	106	29.28
Not Anemic	60				196				256	70.72

### 11. Nutrient intake for students as compared to their RDA:

#### 11.1. Major Element's Intake for Children.

The results of **Table (11)** were shown by analyzing a food retrieval form for 24- recall hours over 3 consecutive days (breakfast, lunch and dinner) dietary intakes (RDI): The highest weight of the meal

taken was (2040 g/100 g), the lowest weight was (130 g/100 g), the average is 511.01g/100 g and the standard deviation was ( 247.989 g/100 g). The largest calories are 3668 kcal/100 g, the lowest calories is (310 kcal/100 g), the average was (950.98kcal/100 g) and the standard deviation was (426.547 kcal/100 g). The largest number of calories from fats was (1540 kcal/100 g) and the lowest calories (60 kcal/100 g), the average was (316.70 kcal/100 g) and the standard deviation was (188.214 kcal/100 g). The largest value of protein obtained by the children was (132 g/100 g), the lowest value was (7 g/100 g), the average was 30.21 g/100 g and the standard deviation was (15.049 g/100 g). The highest value of carbohydrates was (661 g/100 g), the lowest

value was (29 g/100 g), the average was (127.29g/100 g) and the standard deviation was (64.444 g/100 g). The highest value of fiber was (15 g/100 g), while the lowest value was (0.0 g/100 g), the average was (3.83g/100 g) and the standard deviation was (2.367g/100 g). The highest value of fat was (171 g/100 g), the lowest value of fat was (7 g/100 g), the average was (35.19 g/100 g) and the standard deviation was (20.913g/100 g). The highest value of water was (1194 g/100 g), the lowest value of water was (16 g/100 g), the average was (303.75 g/100 g) and the standard deviation was (187.387g/100 g). The obtained data show the mean of protein intake was less than of (RDA).

**Table 11.** Major Element's intake for students.

Major Elements	Students number	Maximum	Minimum	Mean	Standard Deviation
Weight of serving quantity (g)	362	2040	130	511.01	247.989
Calories (kcal)		3668	310	950.98	426.547
Fat Calories (kcal)		1540	60	316.70	188.214
Protein (g)		132	7	30.21	15.049
Carbohydrate (g)		661	29	127.79	64.444
Fiber (16) (g)		15	0	3.83	2.367
Fat (g)		171	7	35.19	20.913
Water (g)		1194	16	303.75	187.387

Whereas RDA of protein:

(From 7 to 9 years) Female and male = 36 g.

(From 10 to 12 years) Male = 43 g. and Female = 41 g.

According to (FAO/WHO, 2002)

## 11.2. Minerals intake for students:

### 11.2.1. Dietary intake of macro elements:

Data in **Table (12)**, it the highest value of calcium obtained by students was (965 mg/100 g), the lowest Value was (16 mg/100 g) the average was (215.94 mg/100 g) and the standard deviation was (152.94 mg/100 g). The highest value of potassium was (4533 mg/100 g), the lowest value was (41 mg/100 g), the average was (1048 mg/100 g) and the standard deviation was (568.777 mg/100 g). The highest value of sodium was ( 6653 mg/100 g), the lowest value (299 mg/100 g), the average (1356.41 mg/100 g) and the standard deviation was (596.432 mg/100 g). The highest value of magnesium was (249 mg/100 g), the lowest value (4 mg/100 g), the average (51.25 mg/100 g) and the standard deviation was (38.148 mg/100 g). The highest value of

phosphorus was (1929 mg/100 g), the lowest value (47 mg/100 g), the average (379.15 mg/100 g) and the standard deviation (231.397mg/100 g).

### 11.2.2. Dietary intake of microelements in **Table (12)**:

It can be said from the results of the study the highest value of copper was (7 mg/100 g), the lowest value was 1 mg/100 g, the average was (0.51 mg/100 g) and the deviation was (1.023 mg/100 g). The highest value of iron was (25 mg/100 g), the lowest value was (1 mg/100 g) and the average was 5.45 mg/100 g. The highest value of zinc was (20 mg/100 g), the lowest was 2 mg/100 g, the average was (4 mg/100 g) and the deviation was (2.211 mg/100 g). The results of the minerals taken were less than the internationally recommended (RDA) of calcium, iron, magnesium and zinc elements.

**Table 12** Minerals intake of macro and micro elements for students.

Items	Minerals (mg / 100 g)	Students number	Maximum	Minimum	Mean	Std. Deviation
Macro Minerals	Ca	362	965	16	215.94	152.193
	K		4533	41	1048.69	568.777
	Na		6653	299	1356.41	596.432

Micro Minerals	Mg	346	249	4	51.25	38.148
	P	362	1929	47	379.15	231.397
	Cu	356	7	1	.51	1.023
	Fe	362	25	1	5.45	3.069
	Zn		20	2	4.00	2.211

RDA: (From 7 to 8 years) Females and males need to  
Ca = 700 g. Fe = 9 mg Mg = 100 mg Zn = 5.6 mg  
RDA: (From 10 to 18 years) Females and males need to  
Ca = 1300 gm for male and female Fe = 15 mg male, female 14 mg  
Mg = 250 mg male, 230 mg female Zn = 9.7 mg male, 7.8 mg female  
According to (FAO/WHO, 2002)

### 12. Dietary intake of vitamins:

It can be said from the results in **Table (13)** of the study that the highest value of vitamin B1 was obtained (7 mg/100 g), the lowest value was (0.0 mg), the average was (0.34 mg/100 g) and the standard deviation was (0.738 mg/100 g). The highest value of vitamin B2 children obtained (7

mg/100 g), the lowest value was 0 mg, the average was (0.40 mg/100 g) and the standard deviation was (1.115 mg/100 g). The highest value of vitamin C students obtained was (466 mg/100 g), the lowest value was (0.0 mg/100 g), the average was (11.72 mg/100 g) and the deviation was (36.654 mg/100 g). These values are lower than the RDA.

**Table (13): Vitamins intake for students.**

Vitamins(mg/100 g)	Students number	Maximum	Minimum	Mean	RDA	standard Deviation
Vit B1	362	7	0	0.34	0.9-1.2	.738
Vit B2		7	0	0.40	0.9-1.3	1.115
Vit C		466	0	11.72	35-40	36.654

RDA of Vitamins B1, B2: (From 7 to 9 years) female and male=0.9 mg and Female 1.1mg for Males 1.2 mg B1 (from 10 to 18 years) and Female 1mg for Males 1.3 mg B2, RDA of Vitamins C: (from 7 to 9 years) female and male = 35 mg from 10 to 18 years) female and male 40 mg  
According to (FAO/WHO, 2002)

### 13. Dietary energy intake in Table (14):

It can be said that **190** Students (52.5%) received less than 50% of the energy intake. **144** Students (39.8%) obtained 50:75% of the energy

intake. **20** Students (5.5%) obtained 75:100% of the energy intake. Eight students (2.2%) obtained more than 100% of the energy intake.

**Table (14): Energy Requirements Intake for Students Compared RDA (%).**

Energy intake	students' number	%
Less 50%	190	52.5
From 50 to 75%	144	39.8
From 75 to 100%	20	5.5
More than 100%	8	2.2
Total	362	100

While RDA of energy: (From 7 to 8 years) female = 66.7k/kg in day and male =70.5 k/kg in day  
RDA: (From 8 to 9 years) female = 63.8 k/kg in day and male =68.5 k/kg in day  
RDA: (From 9 to 10 years) female = 60.8 k/kg in day and male =66.8 k/kg in day  
RDA: (From 10 to 11 years) female = 57.8 k/kg in day and male =64.6 k/kg in day  
RDA: (From 11 to 12 years) female = 54.8 k/kg in day and male =62.4 k/kg in day  
According to (FAO/WHO, 2002)

### Conclusion:

From the obtained results, it can be said that the children's needs for macronutrients have been met, except for fiber and protein and the intake of

elements and vitamins is sufficient except for calcium, iron, magnesium, zinc and vitamins (B1, B2, C). Therefore, products have been manufactured for children suffering from obesity and anemia to

compensate for this lack of nutrients, on the other hand and to encourage children at this age to eat these foods. This study will be of scientific and applied benefit in the field of food industries.

#### Acknowledgements:

The author extends his thanks to Dr. Naglaa Abdel Fattah and sincere thanks to the institute authorities, health visitors, students and mothers for their cooperation in conducting this study.

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## دراسات على الحالة الغذائية لبعض تلاميذ المعاهد الأزهرية

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تهدف الدراسة إلى تقييم الحالة الغذائية لبعض تلاميذ المعاهد الأزهرية بمحافظة القليوبية. أجريت الدراسة في الفترة من عام 2021 حتى عام 2023. ولا يزال الأطفال الذين تتراوح أعمارهم بين 7-12 سنة ضمن الفئة الأكثر تأثراً بالجوع مع سوء التغذية سواء من حيث الجودة أو المكون، مما يسبب خللاً في نموهم وتقدمهم الصحي. وبلغت العينة الإجمالية للتلاميذ 362 من الريف (قرية مشتهر) والحضر (مدينة قها)، منهم 188 ذكراً و174 أنثى. تم إجراء الاستبيان على 362 تلميذ، واعتمد المسح على جمع معلومات علمية عن أكل التلاميذ في المنزل، ونوع الطعام الذي يتناوله كل تلميذ، ومعرفة كيفية تناول الأطعمة؛ الحالة الاجتماعية والاقتصادية واليومية للطلاب. تم أيضاً عمل نموذج لاسترجاع الطعام على مدار 24 ساعة على مدى 3 أيام متتالية، وكانت نتائج تناول الطعام للبروتينات، المعادن، الفيتامينات والطاقة أقل من المستويات الموصى بها دولياً مثل منظمة الصحة العالمية. وتم استخدام مؤشر كتلة الجسم، وأظهرت نتائج الدراسة أن هناك 250 تلميذ طبيعياً، 63 ناقص الوزن، 40 زائد الوزن، 9 يعانون من السمنة المفرطة، 20 مصاباً قصر قامه في الحضر و28 في الريف. قامت وزارة الصحة (حملة 100 مليون صحة) للتعرف والسمنة أيضاً بقياس نسبة الهيموجلوبين في الدم وكانت النتيجة 85 طالباً يعانون من فقر الدم في الحضر و21 في الريف. كما أظهرت نتائج هذه الدراسة وجود نظام غذائي سيئ لدى بعض التلاميذ، مثل عدم الإهتمام بشرب الكثير من الماء يومياً، وتناول الوجبات السريعة، تناول الحلويات وشرب الشاي والقهوة بين الوجبات الرئيسية، مما يسبب إهمال الوجبة الرئيسية وقلّة التنوع الغذائي في المرحلة الابتدائية.

**الكلمات المفتاحية:** الحضر - الريف - سوء التغذية - فقر الدم - السمنة - قصر قامه - التقييم التغذوي